POST-GRADUATE CLINICAL STUDIES

FOR THE GENERAL PRACTITIONER

H. HAROLD SCOTT

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POST-GRADUATE CLINICAL STUDIES

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POST-GRADUATE CLINICAL STUDIES

FOR THE GENERAL PRACTITIONER

FIRST SERIES

BY

H. HAROLD SCOTT, M.B. LOND., M.R.C.S., L.R.C.P.

FELLOW OF THE ROYAL INSTITUTE OF PUBLIC HEALTH; LATE MEDICAL OFFICER IN
CHARGE OF HOSPITAL FOR WOMEN AND CHILDREN, MARITZBURG; ALSO MEDICAL
OFFICER IN CHARGE OF BACTERIOLOGICAL AND X-RAY DEPARTMENTS, AND
ANÆSTHETIST, MILITARY HOSPITAL, MARITZBURG; FORMERLY HOUSE
PHYSICIAN AND ASSISTANT DEMONSTRATOR IN MATERIA MEDICA
AND PHARMACY, ST. THOMAS'S HOSPITAL, ETC.
AUTHOR OF 'COMPOUNDING AND DISPENSING'

CANCELLED
COL. D. BRUCE, C.A.M.G.
EDITOR R.A.M.C. JOURNAL,
WAR OFFICE, WHITEHALL, S.W.

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PREFACE

A FEW words of an explanatory nature are needed to account for the *raison d'être* of this small collection of clinical studies. At various medical meetings before which I have had the privilege of reading papers and reporting cases, it has always been my endeavour to bring forward for discussion questions which are of more interest to the general practitioner than to the specialist, and subjects which are either omitted, or at best receive but very inadequate mention in our ordinary text-books.

The majority of medical men in general practice nowadays are not content, as they were in former times, to let their knowledge rest at the 'qualification stage'; they are not satisfied with an uncertain and possibly hasty diagnosis and mere symptomatic treatment. On the contrary, they spend a good deal of their spare time in trying to keep abreast of modern developments of medical science by studying various professional journals, and in attempting to solve the many difficult problems which daily confront them.

At the suggestion of some of my fellow-practitioners, who were present when certain of these papers were read, and who have told me that they found the points discussed of value to them in their professional work, I have ventured to publish the following selection, in the hope that the subjects dealt with may prove of interest and service to a wider circle.

The first article originally appeared in the *Journal of the Royal Army Medical Corps.* To this I have made a few additions, and, with the kind permission of the editor, I am enabled to include it in the present publication. It is of more than usual interest in showing how a man may sustain an extensive cranial injury and yet exhibit no symptoms, physical or mental, until a considerable interval has elapsed.

Papers III. and IV., as stated in the introduction to the former of these, were written for a medical meeting, under the title of 'The Diagnosis of Empyema,' as a single paper; but when completed I saw that the reading and subsequent discussion of it would occupy too much time. It was, therefore, reconstructed and divided into two. My first object in these has been to see how far we can arrive at a diagnosis of the presence of fluid in the pleural cavity, and of the nature of that fluid, before resorting to exploratory puncture; for even such a small operation as this is often refused in private practice, or consent is only obtained with considerable difficulty.

No. VII. may be regarded in the light of a plea for a more systematic examination of dejecta, and points out a few instances in which the neglect of such a simple precaution may lead to grave error. The inspection of fæces is a disagreeable subject to all of us, and perhaps on that account is so often omitted. I have not attempted to deal with detailed microscopical and laboratory examination of them, but merely with naked-eye examination, a matter for which any practitioner, however busy, can find time, and in some cases, as I think I have shown, important issues may hang upon the result of such inspection.

No. VIII. is included because it is a report of a more severe form of enteric fever than one generally sees in private practice, and is an instance of things which any medical man may meet with at any period of his career; for both these reasons it is of interest.

The last article was originally written with the intention of sending it up in competition for the Alexander Memorial Prize, open to all executive officers in the Army, Naval, or

Indian Medical Services. Since, however, I retired from the Service before the date at which essays had to be presented, this was not sent in. I have included it here because many others besides the regular medical officers in the Service have to deal with soldiers. Many practitioners are Volunteer medical officers ; many others may be employed from time to time as civil surgeons ; and there are others, again, who, though they have no official connection with troops, nevertheless take more than a little interest in military questions. Of these questions, from the medical point of view, at least, that of syphilis is one of the most important.

Of the other papers it is not necessary to speak here ; suffice it to say that they are on subjects regarding which the general practitioner is at times in doubt, and on which the information obtained from ordinary text-books is meagre and scattered. The professional man in busy general practice, even if he be the fortunate possessor of a good library, has not sufficient leisure to look through several books to cull from them the points referring to the subject on which he is seeking for information.

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POST-GRADUATE CLINICAL STUDIES

I

AN OBSCURE CASE OF CRANIAL INJURY

From the ‘ Journal of the Royal Army Medical Corps,’ by the kind permission of the Editor.

THE following case is one of exceptional interest, appealing to both the medical and the surgical branches of the profession, and more particularly, perhaps, to the police-surgeon, presenting as it does many of the points of difficulty in the diagnosis of head injury.

A. B., a private in the 7th Dragoon Guards, came up to the Military Hospital, Maritzburg, where I was on duty, on the afternoon (about 3.30 p.m.) of Sunday, October 25, 1903.

The history of the patient's illness was by no means easy to obtain, as his own statement formed the only source of information (he had only been in the station a day or two to undergo a course of instruction in signalling), and he seemed irritable, and did not reply very readily to questions. As far as could be ascertained, the circumstances were as follows : The previous evening (Saturday, October 24) he was drinking at the bar of a hotel in the town, and after a time his comrades missed him. He does not seem to have returned to barracks that night, but was in camp the following morning, and went on parade as usual. He complained of headache during the morning, and came up to hospital, as stated above, the same afternoon. He told the medical officer that he had a headache and did not feel well, and after some questioning, he stated as a matter of minor importance that he thought it might be due to a 'blow on the head received the previous evening, after which he was unconscious, but could not say for what length of time he remained so'; neither could he say who struck the blow, nor on what part of the head he was struck. He stated definitely that he had not vomited. His temperature was 101·6° F., and he was admitted to hospital. There was no localized pain or tenderness of the skull, and no bruise or any external indication of injury; there was no bleeding from the ears, the membrana tympani were intact, and there was no subconjunctival hæmorrhage.

No other fact of importance was elicited except that he had been out in the sun, which had been very hot, both that day and the previous day. He had had, so he stated, no pain (except for the headache, which was not very severe), no vomiting, diarrhœa, shivering, or cough, etc. Except that he did not reply even as readily as before to questions, and that his temperature had risen to 102·6° F., there was no great change in his condition later on that evening.

The following morning, October 26, fresh symptoms declared themselves. He was quite unable to give rational answers to questions; he was much more irritable and unwilling to reply; his speech was thick and hazy, and he said 'Yes' or 'No' to anything asked, without reference to the nature of the question. When asked his name or regimental number, he would reply either 'Yes' or 'No,' or repeat the syllable 'chub' several times. He seemed to understand what was said to him, for occasionally, when asked to name objects, such as a watch, pen, key, etc., he would repeat the same syllable, and then appear annoyed that he could not give the correct word. He was evidently suffering from motor aphasia. He was more irritable than on the previous evening, and could not be induced to write the names of objects shown to him for identification; agraphia, therefore, could not be tested.

There was no sign of any paralysis of face muscles, but he would not put out his tongue; there seemed, however, to be no affection of this organ, for when he opened his mouth, he would move the tongue, and no deviation to either side could be made out. The pupils were moderately dilated, equal on both sides, and reacted normally. Knee-jerks were difficult to elicit, as the patient kept his legs rigid, but when obtained no difference was noticed in the two limbs. There was no paralysis of any limb muscles.

The same evening the temperature rose to 104·2° F. He passed a very bad night, being exceedingly irritable and violent, requiring constant watching, and only being kept in bed with great difficulty. Calomel (3 grains) had been given in the morning, without result.

On the morning of the 27th the breathing was noticed to be somewhat hissing, noisy, almost stertorous in character, reminding one of the breathing of a patient in a uræmic condition; temperature, 104·6° F.; pulse, 146, and weak. He had had no action of the bowels since admission, so croton-oil (1 minim) was given. He did not appear to recognize or take notice of anyone, although he rolled his eyes from side to side and from one person to another.

His head was shaved and an ice-bag applied, but even after shaving no sign whatever of bruising or external injury could be seen. There was no paralysis detected after careful examination again, though he certainly did not move the right arm and leg nearly so frequently as the left, often, indeed, only on stimulation. The legs were held too rigid to admit of the knee-jerks being obtained; the plantar reflex was present. Slight internal squint of the right eye could now be occasionally noticed, but this was by no means constant. The pupils were still equal, but the right reacted to light very much more sluggishly than the left, and the iris contracted and relaxed slowly again and again while a lighted match was held in front of the eye.

A curious symptom also present was that the right cornea was very distinctly less sensitive to touch than the left. The patient allowed the former to be touched without showing any sign, and after three or four times merely turned his head as if annoyed; whereas when the left was touched he winced, as if it caused pain.

The same morning, as he lay in bed, there was some retraction of the head. This was much more obvious when he raised himself in his delirium or tried to change his position. He passed his urine in bed and had just done so before the morning visit, so none was obtainable then for examination. Temperature at 12.30 p.m. was 105·2° F.; pulse, 150, weak and running.

About this time some urine was obtained by catheter, and on examination was found to contain about three-fourths albumin. There was no sugar. There was no evidence by which one could decide whether this was the cause of his condition—viz., uræmic poisoning—or whether the reverse was the case, and the cerebral condition—*e.g.*, by pressure—the cause of the albuminuria. There were no convulsions or fits of any description. The patient was obviously becoming rapidly worse, and as there were practically no localizing symptoms of intracranial mischief to call for operative interference, he was treated by administration of pulvis jalapæ co. (60 grains), the croton-oil not having produced any result, of which he only took about one-half, and pilocarpine nitrate ($\frac{1}{10}$ grain) was injected subcutaneously, and he was wrapped in blankets.

He very soon broke out into a profuse perspiration, but this did not have any effect whatever on the temperature. His general condition continued to get worse, and the patient died at 3.10 p.m., without again recovering consciousness, and after having been in hospital just under forty-eight hours. The temperature a few minutes before death rose to 105·6° F.; the pulse was very rapid, over 160 per minute, and almost uncountable.

Autopsy performed nineteen hours after death. The body was that of a strong, well-built man, close upon six feet in height, and well nourished. A complete and thorough examination failed to reveal any external sign of injury.

On reflecting the skin of the scalp, there was a small ecchymosis, subcutaneous, but quite invisible from the exterior, about 2 inches by 1¾ inches, just behind and encroaching upon the right mastoid process. This was so slight that at first it was thought to be due merely to stasis from the position in which the body had lain during the night.

Examination of the removed calvarium revealed the following condition: There was a **Y**- or **U**-shaped fissured fracture extending through the tables of the skull, but without any splintering or depression. The posterior limb of the **U** started from the junction of the temporal, occipital, and parietal bones (the occipito-temporal suture forming the upright of the **Y**, if regarded as a **Y**-shaped fracture), and ran almost vertically upwards to within ¼ inch of the parietal eminence on the right side. The anterior limb started from the same suture below, ran backwards and upwards for a short distance, then forwards and upwards, with a curve convex anteriorly, to end about ¾ inch in front and ½ inch below the level of the termination of the posterior limb. Both limbs close to their origin crossed the lateral sinus, and occupying this part of the sinus where it grooves the bone was a small clot.

The convex surface of the brain showed marked congestion of vessels, and in parts of the anterior two-fifths there was a milkiness of the dura mater. There was no sign of any tubercles either on this surface or along the Sylvian fissure.

Over the site of the ecchymosis mentioned above—*i.e.*, the part enclosed by the two limbs of the fracture—was a circumscribed extradural clot of blood, closely adherent to the dura mater.

The brain was very carefully removed, disclosing in the base of the skull a fracture extending from the occipital bone, close to its junction with the temporal, downwards and forwards across the inner third of the petrous portion of the temporal, to enter the suture between the petrous and the basi-sphenoid.

The Brain.—The dura mater was somewhat adherent over the vertex ; there was no hæmorrhage beneath the dura or in the pia mater corresponding to the extradural one mentioned above, and there was no damage to the brain substance at that spot.

At the opposite pole, however (probably by contre-coup), there was a slight hæmorrhage over, and a considerable laceration of, Broca's convolution ; the anterior ascending frontal gyrus was also much lacerated. Extending apparently from this (or perhaps as a separate lesion) to the base of the brain was a clot about the size of a sixpence, but with ill-defined margin anteriorly, situated just in front of the optic commissure to the left, between the median line and the left optic nerve.

All the organs of the body were examined, but, with the exception of about 2½ ounces of slightly turbid fluid in the pericardium, no abnormal condition was found. The lungs were normal, as was also the heart ; the valves were competent, and showed no sign of disease. The liver weighed 64 ounces, but appeared normal on section ; the spleen weighed 6½ ounces ; the kidneys, respectively 5 ounces and 5½ ounces, were normal on section, and the capsules peeled off readily.

The intestines were healthy, and the stomach contained no blood.

Remarks.—The main points of importance in this interesting case are :

1. The severity of the cranial and intracranial injury without any external signs.

2. The effects being so long delayed—namely, for several hours—the patient in the meantime being sufficiently well to be capable of performing his ordinary duties.

3. The question of diagnosis during life.

4. The cause of the lesion.

As regards the first of these, the patient, in coming up to the hospital, stated after a time, and as a fact of minor importance, that he had received a blow on the head. Nothing more definite than this could be elicited in the history, as stated above. A very careful examination was made, but no pain or localized tenderness was discovered, nor any sign whatever externally of a blow or injury to the head ; and even when the head was shaved after the patient was admitted to hospital, and there had been some hours for the bruise to develop, no indication of any injury could be seen.

With reference to the second, it could not be ascertained from the patient exactly when the blow was received, since he was unable to say for how long he remained unconscious, nor when he returned to barracks. He appears, however, to have been able to return alone and unaided, and to have gone on parade the following morning as though nothing had happened. According to his own statement, he did not begin to feel unwell until late in the morning of the following day, though one of his comrades stated that 'he had heard of his having vomited a little blood early that day.' This was not reported till shortly before the patient's death, was merely evidence at second or third hand, and was uncorroborated ; in fact, the patient himself denied having vomited.

The third point is the most important and most interesting —viz., the question of diagnosis during life.

The history being so uncertain and difficult to elicit, and the physical signs being so conspicuously absent, diagnosis during life was a matter of extreme difficulty, if not impossible beyond mere guesswork. The following suggestions were put forward from time to time by various medical officers who saw and examined the case :

1. **Enteric Fever,** with very acute onset, as it were a fulminating type, with marked cerebral symptoms. This, of course, disregarded the history of head injury—at all events, as a causative element. This was not unjustifiable, considering the vagueness of the history and its not being borne out by the presence of any external sign of injury.

The points in favour were :

(1) The temperature steadily, though rapidly, rising.

(2) The complaint of headache.

(3) The presence of a furred tongue.

(4) The condition of generally slow process of cerebration.

Against it were the facts that the headache was not a severe one ; there was practically no previous feeling of malaise ; it took no account, as already stated, of the man's statement as to his injury. The impairment of movement of the right arm and leg, the aphasia and the peculiar condition of the right pupil and conjunctiva, while the left remained unaffected, point strongly to local cerebral lesion. Finally, cases of fulminating typhoid are very rare.

2. **Sunstroke.**—In favour of this :

(1) The man stated that he had been working in the sun, which on both the 24th and 25th had been very powerful (close upon 100° F. in the shade).

(2) He was practically well on the morning of the 25th, being able to go on parade, and did not complain of feeling unwell till the middle of the day, when the sun was at its hottest.

(3) The patient's high and rising temperature and general hazy mental condition, with violent delirium during the following night.

Against this diagnosis :

(1) The peculiar aphasic condition, becoming more and more marked as time progressed.

(2) The hearsay evidence that the patient had vomited in the morning, and had felt a little out of sorts shortly after early parade, while the day was yet comparatively cool; though, of course, the hot sun of the day before might have started the mischief, and the earlier sun of the next day have completed it.

(3) The signs already detailed under the last heading, pointing to local cerebral lesion, are strong evidence against the diagnosis of sunstroke.

3. **Meningitis,** more likely cerebro-spinal meningitis, but possibly tuberculous.

Pro : (1) Pupils not very dilated, but the right reacting more slowly to light than the left.

(2) Retraction of the head, which supervened on the second day after admission.

(3) The patient's general irritability.

(4) Sudden onset after a short interval, if of the tuberculous variety, induced by injury to the head.

Contra : (1) There was no irritative sign, such as spasm, twitching, convulsion, or fit of any sort.

(2) No confirmed history of vomiting.

(3) Headache not very severe.

(4) Aphasia, purely motor, and no sign of any involvement of neighbouring areas, and no paralysis.

(5) No history of tubercle, and patient seemed to have been a strong, healthy man previously ; no signs of any affection of the lungs ; also, the symptoms came on almost too soon after the blow (if due to tuberculous meningitis), and increased in gravity with such alarming rapidity.

(6) Attempts at examination of the fundus were strongly resisted, but as far as could be seen there were no tubercles detected in the choroid and no signs of optic neuritis.

4. **Uræmia.**

Pro : (1) The increasing unconsciousness, preceded by complaint of headache.

(2) The character of the breathing.

(3) The presence of a large amount of albumin in the urine.

Contra : (1) No history of previous kidney trouble, and patient had not the appearance of a man suffering from renal disease, and nothing pointed to acute nephritis, such as pain in the loins, suppression of urine, etc.

(2) No history of previous headache—previous, that is, to the onset of the present one—no twitchings, convulsions, or epileptiform fits.

(3) Patient's age and previous good health.

(4) Urine passed quite freely throughout his time in hospital.

The question of the presence of albuminuria in injury to the head is one of great importance, since, as in the present instance, the quantity may be large without Bright's disease or other recognizable condition of the kidneys to account for it. We must, therefore, be on our guard against jumping to the conclusion that, because we find albumin in the urine of an unconscious patient, the condition of unconsciousness is due to kidney lesion. The connection between diseases of the nervous system and albumin in the urine has not yet, so far as I am aware, been made clear—in fact, Pye Smith doubts whether nervous disease does cause albuminuria. The condition, however, is not at all infrequent in concussion and cerebral hæmorrhage—at least, in small quantity, and occasionally in considerable amount; also after an epileptic seizure albumin is found in the majority of cases, and if present in the intervals, the proportion may be markedly increased after an attack.

5. **Intracranial Injury.**

Pro : (1) History of blow received a few hours before the onset of more acute symptoms.

(2) General slow cerebration, and hazy mental condition.

(3) The aphasia, its character and method of increase.

(4) The condition of the pupils, both being moderately dilated, but one reacting to light more sluggishly than the other.

(5) The condition of the cornea, the right being so distinctly less sensitive to touch than the left.

(6) The gradually increasing temperature and rate of pulse, in spite of profuse perspiration, pointing to pressure or some form of irritation of the centres.

(7) The albuminuria, possibly due to cerebral pressure also.

Contra : (1) Interval rather prolonged for such acuteness of symptoms later.

(2) No sign of blow or injury externally, yet symptoms severe and rapid.

(3) No history of previous ear trouble, no disease, hæmorrhage, or perforation revealed by aural examination, and no tenderness anywhere over the scalp.

(4) So far as could be seen, no sign of optic neuritis.

(5) Aphasia might be syphilitic, but no history of syphilis, and the temperature still unexplained.

(6) Cause seemed inadequate from the history.

The question finally remaining is, What was the cause of the injury itself as seen post-mortem ?

Firstly, if the patient had been drinking heavily, and had sustained a fall sufficiently violent to produce such grave injuries, he would hardly have been in a fit state to find his way to barracks unaided and to go on parade the following morning. Also, such a fall would almost certainly have cut the skin and shown some signs of bruising, either on the head or other parts of the body, according to where he was struck in falling.

Secondly, although the fracture of the calvarium was localized to about three-fifths of the circumference of a circle of radius 1 inch to 1½ inches, any weapon such as a knobkerrie applied over such a limited area would have, in all probability, cut the skin, and produced a considerable bruising, more marked fracture, and splintering of the inner table, with depression and its symptoms, whereas there was no splintering or depression whatever.

Thirdly, the injury may have been produced by some heavy but dull, blunt weapon, which would give a blow whose force would be distributed over a comparatively large area, so as not to lead to any noticeable bruising or laceration of the skin. A sand-bag is a likely object to produce such a result, the man being struck from behind a forcible blow over the right side behind the ear over the occiput and adjacent mastoid, the bone being fractured over the prominent part of this area, and the fracture extending to the base. The violence of the blow would produce concussion, and by contre-coup laceration in the left frontal region of the brain—in this case the third left frontal (Broca's) convolution, and the anterior frontal convolution—with some hæmorrhage at the base of the frontal lobe, either from laceration or rupture of small capillaries there.

Finally, the condition of the bones might have arisen from indirect fracture—as, *e.g.*, the man jumping from a window on to his feet—and so fracturing the base of the skull. This, however, would not be likely to produce the fracture of the parietal bone, and it also involves greater difficulty in explaining the laceration of the frontal lobe by contre-coup, though it would account more readily for the small hæmorrhage of the optic commissure ; but, as already stated, whether this last was a separate lesion or whether the blood had come from the lacerated brain anteriorly and gravitated there, I am unable to say, but I incline to the former, seeing that the staining was not quite continuous between the clot at the commissure and the laceration and staining from hæmorrhage at the anterior frontal gyrus.

AFTER-NOTE.

At the investigation held by the Criminal Investigation Department of Natal, after the above report was written, it was brought out in evidence that the patient had received a blow on the head from a knobkerrie. It appears that he was wearing his helmet at the time, and in all probability, therefore, although the blow must have been a severe one to produce such extensive injuries, the localized force was rendered more diffuse by the hard covering of the helmet, and this possibly explains the fact that there was no external sign of injury to the skull.

II

THE DIAGNOSIS OF SUBPHRENIC ABSCESS

This paper was written for a meeting of the Shropshire and Mid-Wales Branch of the British Medical Association, May, 1906.

Mr. President and Gentlemen,

Since I have only recently come to reside in this district, you will, I am sure, understand that it is with more than a little diffidence that I venture to-day to address such a meeting. My reasons for selecting the subject of the diagnosis of subphrenic abscess are, firstly, that it is one that appeals to both physician and surgeon, though more especially to the former, because with him in the majority of cases rests the onus of diagnosis and of calling in the surgeon before it is too late ; secondly, because the mortality from this affection is very high, and this mortality, though possibly due to the surgeon as direct cause, is in far greater measure due to the physician as predisposing. I state matters thus boldly, because I am not a surgeon. I gave up several years ago the little dabbling in surgery in which I had formerly indulged as a general practitioner, feeling that it was not possible to attempt proficiency in two such large branches as medicine and surgery. Since that time I have given medicine my sole attention, and feel, therefore, that I can give good reason for the faith which is in me, and am willing to bear any burden of responsibility you may be inclined to thrust upon me for making such a statement as the above.

The early diagnosis of subphrenic abscess is a subject of much interest, of vast importance, and far from easy. Responsibility rests largely with us as physicians or general practitioners, because it is often due to our failure to recognize sufficiently early the condition of things that operative measures so frequently turn out to be of but little avail.

Time will not allow of a detailed description of the cases which I have had under my own observation—amounting now to fourteen in number—but the following remarks, based upon them, will, I feel sure, be of interest :

The abscess may be in contact with the lower surface of the diaphragm or in the lesser sac of the peritoneum. The abscess cavity may contain air in addition to pus ; the condition then goes by the formidable name of subphrenic pyopneumothorax.

The **general diagnosis** is founded upon the history, the symptoms, and the physical signs. These three must receive detailed consideration.

1. **History.**—In the majority of cases there have been preceding symptoms sufficient to enable one to make a fairly shrewd guess as to the cause. Thus, previous and long-continued pain, with vomiting and hæmatemesis, or it may be melæna, pointing to gastric or duodenal ulceration, or carcinoma of the stomach, the now classic symptoms of appendicitis, or a history of jaundice and pain or other signs indicative of gall-stones. Rarer conditions must not be forgotten, such as suppuration in connection with an abscess or hydatid of liver. I have seen abroad three cases of subphrenic abscess due to the former and one to the latter. Occasionally the condition may arise from peritonitis of tubercular nature. I remember one patient in whom this was the probable origin : downward extension of an empyema or upward extension from a perinephritic or perityphlitic abscess. Such cases cannot, I think, be common, though I have had the good fortune to see two of the latter—one by direct spread, the other indirectly from an attack of appendicitis. This structure had healed, but later a liver abscess formed, which in turn led to subphrenic abscess. This last patient died, and post-mortem a pin was found lying lengthwise along the lumen of the appendix. The abscess in these cases may be in contact with the posterior part of the diaphragm, and be retroperitoneal as regards position.

The history of *the mode of onset* is different in different cases. The affection may arise gradually, definite symptoms being preceded by pains of vague character referred to the shoulder, usually the right, the lower part of the thorax, and adjacent part of the abdomen, together with slow but progressive failing of general health, symptoms by no means distinctive. Other cases come on with startling suddenness quite acutely, with severe pain and difficulty of breathing.

2. **The Symptoms.**—Locally there is pain, which is usually severe. Its situation is very variable, patients describing it as being in the shoulders, the back, the sides, or the epigastrium. Of these, in my experience, the commonest has been the side, and next to that one or other shoulder. The last case, which I saw in consultation some six months ago, had complained greatly of severe pain in the left side, which had been treated with belladonna plasters, and later by vigorous rubbing with counter-irritant liniments of increasing strength, in the belief that the malady was intercostal neuralgia. The result of this mode of treatment had, not unnaturally, been somewhat disappointing, both to the patient and to the medical attendant. There was a typical history of a gastric ulcer which had been treated with bismuth, the result being considerable improvement, but not cure, since the pain on taking food still remained, though much less severe. On examination, the symptoms and signs (to be spoken of later) pointed to the presence of a subdiaphragmatic abscess, and such was found to be the case at an operation performed three days afterwards.

To return to our discussion : The pain, which may be, and usually is, very severe, is intensified by deep breathing and by coughing. Cough is frequently present, and occasionally very distressing ; dyspnœa is common, partly from the impediment to deep breathing, partly owing to the fever, partly to lung complications.

Gastric symptoms, associated with more or less obstinate vomiting, occur, due to the inflammatory abdominal condition in part, and also, it may be, to the continued action of the primary cause—*e.g.*, gastric ulcer. Should the abscess spread through into the lung or perforate into the thoracic cavity, acute pulmonary symptoms, with severe and troublesome cough, supervene.

General symptoms are : Irregular pyrexia, with temperature of a remittent character, or it may be distinctly hectic, with occasional rigors, but more frequently shiverings and perspirations, which may be profuse. As a result of the fever, the gradual failure of health, and the inability to take nourishment (as when the condition follows on gastric ulcer), emaciation is common.

3. **Physical Signs.**—The patient looks ill, has a pale, sallow complexion, and the drawn, sunken features typical of the abdominal facies. In the later stages the tongue is dry, brown, thickly furred, the lips may be covered with sordes—in fact, the patient exhibits the characteristic signs of the typhoid state, with possibly low, muttering delirium, subsultus, rapid low-tension pulse, etc., though before this condition is reached there are usually abundant indications of serious disease.

Abdominal Signs.—On *inspection* of the patient a certain amount of distension may be seen, more especially in one or other hypochondrium or in the epigastrium, and there is diminished movement of the lower part of the thorax, and of the upper part of the abdomen on respiration. *Palpation* will render this still more evident, and frequently will elicit a certain amount of tenderness, either general over the upper part of the abdomen, or more limited to the epigastrium or one or other hypochondrium. The diffuse tenderness in the region of an abscess may be so great that palpation has to be of the lightest, but not uncommonly there is some special point of tenderness which may give a clue to the originating cause of the affection, such as over the stomach, gall-bladder, or kidney area when bimanual palpation is employed. If the abscess lies over the right lobe of the liver, that organ will show descent and be palpable with regular edge below the costal margin. This pushing down of the liver as a whole—the lower edge not losing its regular outline—is one of the most important and useful diagnostic signs occasioned by a subphrenic abscess in this situation.

On *percussion*, the signs may be of considerable variety—according to the side affected, according as the condition has supervened upon abdominal or thoracic disease, whether it is complicated by the coexistence of pleurisy—simple or suppurative (empyema)—and according to whether the abscess cavity contains air or not—*i.e.*, whether the condition is merely a subphrenic abscess or a subphrenic pyopneumothorax. Should the latter be the case, for example, and on the left side, the air contained will give a tympanitic note which may to greater or less degree obliterate the liver and splenic dullness on that side, and pass directly into the lung resonance above it, or be separated from the normal lung resonance by a dull area due to pleuritic effusion. If due to a liver abscess, or situated above the right lobe of the liver, the area of dullness will be enlarged upwards, and is frequently arched over the front and middle of the axillary area as well as posteriorly, thus simulating to some extent an ordinary pleuritic effusion.

If the abscess be on the left side, the normal resonance over the stomach will be more or less obliterated, and give one the idea that the dullness of the normal splenic area is considerably increased, and this fact, associated with an anæmic state and irregular fever, may put one on quite a wrong track.

Should the subphrenic abscess on the left side be an air-containing one, the difficulty of diagnosis would be still further increased, because of the normal note which the area over the stomach might give.

On auscultation—a very useful means of diagnosis, particularly if the condition be that of subphrenic pyopneumothorax—there will be one or more of the signs of ordinary pneumothorax, such as coin-sound, amphoric echo of breath- and voice-sounds, and it may be of heart-sounds also, with possibly succussion. Though this introduces another affection from which the condition has to be diagnosed, the presence of these signs may in fortunate instances be the very ones by means of which the disease we are considering can be differentiated. For if such signs—namely, those of pneumothorax—extend beyond the limits of the pleura, the nature of the affection must be more than a simple pneumothorax. In subphrenic pyopneumothorax the cavity signs may be found to pass downwards over the hepatic area, over the stomach, and also backwards. In this connection extension beyond the limits of the pleura transversely is of greater importance than extension longitudinally, for the downward limit of resonance in ordinary pneumothorax may, on account of the flattening of the diaphragm, be such that on the right side the liver dullness is practically abolished.

Physical Signs in the Thorax.—Subphrenic abscess may affect the lung in one or more of the following four ways, or, as I would prefer to call them, degrees :

1. First degree : Elevation of the diaphragm on one or both sides.
2. Second degree : Compression of the lung at its base.

3. Third degree : By extension of the inflammatory process an effusion may be set up in the pleura, simple or purulent.

4. Fourth degree : Perforation of the abscess into the pleural cavity or lung. This may take place suddenly on exertion, or gradually by slow extension of the inflammatory process.

The following conditions may then be found on physical examination : There will be diminution of movement of the lower part of the thorax on respiration, and possibly some bulging of the lower spaces. Palpation will render this, if present, more evident, and may also reveal an absence of vocal fremitus over the base of the lung. Percussion will probably show dullness at the base, due to compression of lung, the result of pushing upwards of the diaphragm, or the dull note may be due to coexistent pleurisy with effusion. Of course, both of these causes may combine to produce lung compression.

The most important signs will be found on auscultation. These may be either those of compression of lung, of consolidation, or of effusion. There is no need to repeat here what these are.

Should the condition be that of subphrenic pyopneumothorax, the signs are almost unmistakable. There is in many cases an abrupt transition from the ordinary pulmonary vesicular murmur above to an amphoric echo over the lower part, and there is a tympanitic note given on percussion, commencing at times quite abruptly below the pulmonary resonant note. At other times this tympanitic note may be separated from the pulmonary resonance by an area of dullness, due to compression, consolidation, or pleural effusion, with skodaic resonance over the adjacent part of the lung above.

The heart may be thrust out of its normal position, but unless there is considerable effusion in the pleura this organ is not displaced sideways, or to a slight extent only. The displacement is upwards.

The results of exploratory puncture may not always reveal the nature of the affection, but at times is absolutely diagnostic. Thus, in one case which I had the good fortune to see exploration at different levels led to the finding of two kinds of fluid—clear, straw-coloured fluid of pleural effusion above, and purulent fluid from the abscess below, the diaphragm.

The abscess may be limited, as stated at the outset, to the lesser sac of the peritoneum in certain perforating gastric ulcers, in some inflammatory states of the colon, in certain pancreatic affections, and in some cases of localized tuberculous peritonitis. There is in these cases a swelling, varying in size, as judged by percussion, according to the condition of the stomach, situated in the left hypochondrium, epigastric and umbilical regions, but with the colon always below it.

'The diagnosis of subphrenic abscess is not often made ; the perihepatic abscess beneath the arch of the diaphragm, when it does not contain air, is nearly always mistaken for empyema,' says Professor Osler. This, I think, most medical men will agree with ; but in those cases in which air is present I feel sure that mistakes need not be as frequent as they are, if a thorough examination is made, and the state of things found is carefully thought out. The diaphragm may be pushed up to the level of the third rib, or even the second, and the physical signs are very similar to those of pneumothorax, especially the tympanitic resonance and movable dullness ; the liver is pushed down, simulating enlargement with even edge, and there is bulging on the right side.

Differential Diagnosis.—This is at times a most difficult matter, but, as a rule, less so when the condition is on the left side than when on the right, for the probabilities of liver affections are less, and the question therefore one of less obscurity, having regard to what has been already mentioned concerning the percussion-note over the stomach. This will be readily understood from what has already been said on the point of physical signs, aided to a large extent by the history of the previous illness—*e.g.*, ulceration of the stomach. Detailed points of differential diagnosis would take up more time even to enumerate, far less to discuss, than you could allow me now, and I fear that I have already trespassed greatly on your patience. I will therefore merely put before you a few points which have occurred to me as aids to the elucidation of this fascinating but difficult question ; for, at all events, in the cases which have come within my experience the indications, either symptoms or physical signs, have rarely been so clear as to warrant the diagnosis of subphrenic abscess being made with more than a moderate degree of certainty ;

and since the mortality from this affection is so high—about 80 per cent.—any trouble undertaken to diminish this degree of uncertainty will be indeed a πονος ἀπονος, if it results in our being able to let the surgeon know of the condition before it is too late. The operation is by no means too formidable for modern surgery, and the high death-rate is due, I feel sure, in great part to the physician failing to make the diagnosis sufficiently early. If this can only be done, it will enable operative measures to be undertaken before the patient is in such a state that any interference becomes almost a forlorn hope, and the mortality would thus be reduced of a disease at present truly a terrible one.

The symptoms and physical signs being, as they so frequently are, in part abdominal, in part thoracic, the great question arises, Is the disease above the diaphragm, below the diaphragm, or both above and below ?

Diaphragmatic pleurisy, it must be remembered, often causes abdominal symptoms—at least, in the early stages. In children this is frequently the case for a longer period than in adults ; or perhaps it is better stated in another way—viz., that from a child's inability to describe accurately its symptoms, the thoracic nature of the affection is overlooked for a longer time. I had three cases during a single month (last April) in children in whom a lobar pneumonia started with diaphragmatic pleurisy and marked abdominal symptoms. In them, of course, subphrenic abscess is rare, except as localized tubercular peritonitis, but it is for the cases less often met with that we long for guides to help us.

I venture to place before you the following points in connection with this question. They are points which will probably occur to all of you, but recapitulation is not always waste of time. As regards the question, then, as to whether the disease has originated in the chest or in the abdomen :

1. *If it be subphrenic*—

(1) The history will point to previous abdominal trouble.

(2) The primary symptoms will be abdominal. This, however, may be the case, as just stated, in diaphragmatic pleurisy, but the previous history and the course of the disease would soon eliminate this.

(3) A corollary from the last, the thoracic symptoms will be secondary.

2. *If the affection be confined to the abdomen only*—

(1) The heart, though it may be displaced, is displaced upwards, not laterally.

(2) The physical signs over the lower part of the lungs are unaltered, while in the case of subphrenic pyopneumothorax there may be found the abrupt transition, as already mentioned, from the ordinary pulmonary vesicular murmur to the amphoric echo of the heart- and breath-sounds over the upper abdominal area, the subphrenic area. This point, however, must not be pressed too far, since, even when the affection is abdominal only, the base of the lung may give signs of compression, etc., as has been stated previously.

(3) The physical signs, though the disease is situated just at the base of the lungs, may not extend even to the side of the chest, still less to the back, so that they are mainly, and in many cases entirely, confined to the front.

3. *If the disease*, as by extension upwards of an abdominal affection, or by downward spread of a thoracic one, *be situated both above and below the diaphragm*, the history of symptoms and the physical signs will show a mingling of both, but the history will frequently indicate the seat of the origin.

Applying these points—we might almost denominate them axioms—to the diagnosis of the four diseases with which subphrenic abscess is most often confounded, I can best illustrate to you what should be our trend of thought in such cases, and how the diagnosis may be arrived at with a greater degree of certainty.

1. **Pleural Effusion or Empyema.**—The history of the onset and course of the disease is here of the greatest importance. Abdominal symptoms will have preceded for some time any thoracic symptoms. We must not forget that both conditions—subphrenic abscess and pleural effusion—may be, and often are, found together. The history will still help us to a large extent, but an important point exists in the physical signs—viz., that the amount of effusion is often small, and then not in the usual situation of the mid-axilla at its highest spot, but anteriorly. The very smallness of the effusion with such grave constitutional signs is sometimes an aid, especially if on exploration simple fluid, and not pus, is discovered. If the abscess be on the left side, there will be the additional signs of the position of the heart's apex-beat and the outline of the dullness on accurate percussion. The displacement of the apex-beat, as already stated, is upwards; lateral displacement

is but slight, unless there is considerable effusion into the pleural cavity.

2. **Pneumothorax.**—A subphrenic pyopneumothorax is to be distinguished from ordinary pneumothorax by attention to the following points :

(1) The previous history is that of abdominal disease, one of those above mentioned, in contradistinction to thoracic. It must not be forgotten, however, that if the cause be a loculated tubercular peritonitis there may reasonably be a history of pulmonary tubercle, or, of course, phthisis may possibly coexist with any of the affections which have led to the production of the subphrenic abscess.

(2) That if the abscess be large enough to cause any displacement of the heart, this displacement is not lateral, as would be the case with lung affections, but upwards only. Here, again, a word of warning must be given, for should the abdominal condition have led to the production of a simple pleurisy, if this becomes extensive the heart may be displaced laterally ; but such a secondary pleuritic effusion is rarely sufficiently large to cause this amount of displacement.

(3) The point now to be mentioned is, I think, the most conclusive of all. The physical signs of the presence of air are not limited by the areas of pleura. The liver dullness may be altogether obliterated and the signs of air extend too far down both in front and behind, and, more important still, transversely, to be consistent with the condition of pneumothorax.

(4) The sudden transition from the signs of the presence of air to those of normal pulmonary resonance and vesicular murmur is very remarkable, and, when present, is of great service, but in the cases which I have seen I have found it of real diagnostic value only in three ; in the rest the associated lung condition did away with the suddenness of the transition.

(5) This, the last sign, is, if present, also absolutely diagnostic. I have noticed it in four of those which have come within my experience. On careful percussion, with the patient in an upright or semi-recumbent position, a tympanitic note is obtained over the subdiaphragmatic region according to the amount of air present ; above this is an area of dullness due to the presence of fluid, a simple or purulent pleuritic effusion ; passing up still higher, we again come to resonant lung or

to the ‘ boxy ’ skodaic note, if the effusion is sufficient to cause a certain amount of compression of lung tissue.

3. **Suppuration of a Hydatid Cyst.**—The main point—in fact, almost the only one by which this can be distinguished with any degree of certainty—is a careful consideration of the history. It most cases of hydatid cyst there will be an account of a swelling of the upper part of the abdomen, localized at least in the earlier stages and painless, and probably causing no symptoms whatever. Later, one will be told there came on attacks of shivering and fever ; the swelling became painful and tender, and possibly jaundice was observed. Only by some such history as this, I think, can such cases be diagnosed from a subphrenic abscess arising from other causes where the history points to stomach, appendix, etc.

From hepatic abscess, again, the history is the chief means we have to go by. The condition may not be diagnosed until either an exploratory puncture or laparotomy is performed, when the contents (if the abscess be due to a suppurating hydatid, for example) will clear up all doubt. About exploratory puncture may I venture to add a word of warning ? The wall of a hydatid cyst, if the fluid within is at fairly high tension, is liable to tear extensively on insertion of the exploring needle. I shall never forget a case of hydatid of lung into which an aspirating needle was inserted, in the belief that there was pleural effusion present, possibly loculated. It happened nine years ago, but I remember the circumstance as though it were yesterday. Immediately after the needle was introduced the patient became very distressed in breathing, and died in a minute or so. Post-mortem, it was discovered that on the cyst being punctured, the wall had ripped up, and the fluid contents had flooded the lungs and caused death by drowning.

4. Lastly, from **Typhoid Fever.** To illustrate this, I will relate in conclusion the notes of a case of subphrenic abscess. The patient, a man of thirty-five years of age, came to hospital on the third day of illness complaining of severe epigastric pain, with occasional vomiting. A history of previous ulcer of stomach was given, but as the pain at that time had come on as a rule about an hour after food, with passage of tarry motions, but no vomiting of blood, I am inclined to think that the ulcer was more probably duodenal than gastric. The idea of typhoid fever was considered in this case because

the temperature rose in a somewhat ‘staircase’ manner for the first few days after admission. There was a slight enlargement of spleen, and some tenderness in the ileo-cæcal region. The Widal reaction, however, which I tried on two occasions, each time gave a negative result. Ehrlich's diazo reaction (on which not much reliance can be placed as regards diagnosis of typhoid) was absent on three occasions on which it was tried; there were no pinkish lenticular spots. And lastly, there was some degree of leucocytosis, and this condition, most modern pathologists are now agreed, is rarely found at an early stage of enteric fever; also the invasion seemed to be very abrupt for that affection.

Besides the pain, vomiting, and tenderness, there was considerable dyspnœa, respiration being painful, shallow, and quickened to 34 per minute. At the end of four or five days more definite signs of the presence of pus made their appearance: rigors, sweatings, temperature changes indicative of pus, pallor and wasting, and the breathing became still more embarrassed. By this time the physical signs had become much more definite. The epigastrium and now the right hypochondrium also were obviously very tender to the touch, and were seen to be prominent—in fact, almost bulging; the right lobe of the liver could be felt between two and three fingers' breadths below the costal margin, smooth and regular. On percussion this area was dull, and the dullness extended upwards as far as the fourth interspace, and just above this was a narrow band of tympany—air in the abscess cavity—with high-pitched skodaic resonance above this—compressed lung—at the upper part of which was subtubular breathing. The heart was slightly displaced to the left, less than would be the case with an empyema of such a large extent. The diagnosis of the condition was confirmed at the operation and at the post-mortem, which took place two days later, the case unfortunately terminating as the majority of such cases do.

III

DIFFICULTIES IN THE DIAGNOSIS OF PLEURAL EFFUSION.—THE DIAGNOSIS OF EMPYEMA, MORE PARTICULARLY CONSIDERED WITH REGARD TO THE CONDITION IN CHILDREN

THE two following papers—(1) 'Difficulties in the Diagnosis of Pleural Effusion'; (2) 'The Diagnosis of Empyema, more particularly considered with Regard to the Condition in Children'—were originally merged into one, entitled 'The Diagnosis of Empyema,' written for a branch meeting of the British Medical Association. On completion, however, it was found that unless several points of importance were omitted, or but very inadequately treated, the reading of the paper and its subsequent discussion would occupy more time than could be spared at a single meeting. Consequently the subject-matter was divided and dealt with under two heads. The second is, therefore, to be regarded in the light of a sequel to the first, for when the question of the diagnosis of empyema comes up for consideration in any patient, our process of reasoning for obtaining confirmation or refutation of such a decision takes place in two stages—that is, there are two main questions which we instinctively ask ourselves:

1. Is pleural effusion present?—Having come to the conclusion that there is effusion,
2. Is the fluid which is present purulent?

1. Difficulties in the Diagnosis of Pleural Effusion.

In those cases which begin with fever, pain in the side, cough, shallow breathing, limited movement, friction-sounds, etc., with which all are familiar, we have, as a rule, no difficulty, if we have watched the case from the onset. I will not therefore take up your time by dealing with such. Many, however, are not seen by us in this early stage, and if such signs and symptoms have been present, they have not been so marked, or they have been overlooked or forgotten. The history may therefore be imperfect, particularly so in children who are too young to describe initial or, for that matter, any other symptoms, and we have consequently to rely merely on the statements of the parents—statements which are often faulty.

In others, again, such symptoms and signs have really been absent, the onset has been gradual, and the only history obtainable is that of increasing difficulty of breathing. I met with a case illustrative of this in April, 1906. I was called in to see a young man twenty-one years of age. Very little in the way of detailed history could be obtained from him, as he was reticent about his symptoms, and resented the fact of his parents having asked me to see him, since he felt, as he described it, 'only a little run down.' He was an only son, and the parents were naturally anxious. They gave a history of his having complained of a 'stitch in the left side' three weeks previously. A linseed-and-mustard poultice had been applied; the pain seemed to have been completely relieved thereby, and the patient continued at his work regularly. Since then he had gradually 'gone off his feed,' and for the last week had been getting short of breath. His meals had been very irregular: often he would go without dinner altogether; at other times he would take a hasty mouthful or two in the intervals of attending to customers. He had to walk daily about half a mile to and from the shop where he worked. He was a touchy, nervous individual. There was no history of alcohol or of syphilis. His paternal grandfather had died, it was said, of consumption, and the parents thought that the patient strongly resembled him in features; and he certainly did bear a remarkable likeness to a portrait of his grandfather taken when he was about twenty-five years of age. On examination while he lay quietly in bed there was only a little dyspnœa, but on moving to change his position this symptom became much more marked. The left side of the chest moved barely at all on respiration, and was dull to percussion; vocal fremitus and resonance were absent over the lower two-thirds; ægophony was present over the upper part in front, and the heart was displaced to the right. He was tapped, but after 15 ounces of sero-fibrinous fluid had been drawn away he appeared very distressed, and the operation was stopped. The next day he breathed a little better, but still the apex-beat was further to the right than normally. Little if any absorption of fluid took place during the ensuing four days—in fact, it again reaccumulated. A week after the first operation 30 more ounces were drawn off, and much relief resulted. Again, ten days later, another 15 ounces were taken away, and since then there has been no reaccumulation, and the patient keeps fairly well, but tends rather to lose weight. I am inclined to regard this case as tuberculous, though after centrifugalization I failed to find any tubercle bacilli; but that, of course, is by no means uncommon. I should like to have had the fluid tested by inoculation, but it was unfortunately thrown away. Failure to discover the bacillus in the fluid withdrawn, as all are aware, by no means places tubercle out of court. He would be exceedingly fortunate who, by examination in the ordinary way, happened to find the organism, but I hoped after centrifugalization I should be successful. Probably an insufficient quantity of the fluid was used, for even in inoculation experiments, unless a considerable amount is injected, the result is often negative. The discovery of the bacillus is therefore a valuable positive indication, but of no account as a negative one.

From the general characters of the attack, such as the apparently spontaneous origin, the sero-fibrinous nature of the exudate, and the general condition of the patient, one can often hazard a shrewd guess as to the probable tuberculous nature of the pleurisy, and this is in a large percentage borne out by the subsequent development of tuberculous lesions elsewhere, by the presence of nodules in lungs and enlarged bronchial glands post-mortem, and by the tuberculin reaction.

A gradual onset without acute symptoms may occur in affections other than tubercle—such, for instance, as diabetes mellitus, gout, and Bright's disease—but with the differential diagnosis of these we are not concerned in this paper, which treats merely of the question as to whether pleural effusion is present or not, and in the succeeding paper, if it be present, whether that effusion is simple or purulent.

If the onset be gradual and the accumulation of fluid slow, one side may unexpectedly be found to be almost full, and the heart may be considerably displaced without any, or only very slight, dyspnœa being evident ; and unless thorough examination is made, the true cause may be overlooked, and the increased rate of breathing be attributed to the presence of fever which may be coexistent. More especially is this the case in children, in whom also the physical signs are considerably modified from those which we are accustomed to note in adults. This may be explained by the fact that the slow accumulation allows for compensation to take place, just as is seen in the spread of pulmonary tubercle where the rest of the lung to some extent compensates for the part diseased, while at the same time the emaciated body requires less oxygen, so that the disease may have made considerable progress before definite physical signs are detected.

It will be well to enumerate rapidly the physical signs by which one is usually led to recognize effusion into the pleural cavity.

Inspection.—More or less diminished mobility of the affected side is noted on respiration, according as the amount of fluid is large or small. If the amount is considerable, the intercostal depressions appear less marked than normal, and may be even obliterated (Stokes attributes this to 'nerve influence,' and not to pressure merely, as it is more marked with purulent than with simple effusion, and more with the latter than in extensive hydrothorax), and the whole side consequently looks larger than the other. This sign is somewhat deceptive, for often when the enlargement appears to be considerable actual measurement shows but little increase. Displacement of the apex-beat is an important sign. If the effusion be right-sided, the beat may be seen outside the nipple line in the fourth space ; if left-sided, the heart and mediastinum are pushed over to the right, and the apex-beat may be in the epigastrium, or even more to the right still ; or, again, if beneath the lower end of the sternum, the impulse may not be visible at all. The decubitus is also important, the patient lying usually on the affected side, and being very reluctant to change his position ; and, further, if the effusion is in considerable amount, the dyspnœa may be markedly increased, owing to the embarrassment of respiration, when he lies on the sound side.

In five cases I have noted the peculiar symptom of inequality of pupils. In each of these there were signs of enlarged glands, possibly tuberculous ; in two this was undoubted, so that I am inclined to the idea that the inequality is due to pressure on the sympathetic by a bronchial gland. Some, I believe, attribute the symptom to pressure of the accumulated fluid, but in the cases I speak of the last three, at all events, did not lose this symptom after the fluid was drawn off ; the first two I do not recollect, and I am sorry to say the point is not mentioned in my notes of the cases. Further, I have seen it twice in cases where the affection was ordinary dry pleurisy, with very little, if any, exudation at all. This appears to militate altogether against the latter theory.

By **Palpation** some of the above points are rendered more evident. Vocal fremitus is diminished, perhaps to complete absence, if the quantity of fluid is large ; this, however, does not hold good in children, as will be shown later.

Percussion reveals dulling of the note to absolute flatness, if the amount is large, with a sensation of non-resilience and resistance ; above the upper limit we find the peculiar tympanitic note of skodaic resonance. The upper limit of the area of dullness varies from the so-called S-curve of Ellis's line, when the quantity is small, to the flattened curve as the height rises posteriorly. This dullness, in spite of many observers who have written on the subject, rarely, if ever, changes its level with change of position of the patient. I have tried frequently to find it, but the only ones in which there seemed to be any change at all were those cases where the fluid was not purely inflammatory exudate, as a true pleuritic effusion, but, for example, in cases where the pleurisy complicated, renal disease ; and for this I think an explanation can be found in that the inflammatory fluid was, as it were, mixed with non-inflammatory transudation fluid (hydrothorax) from the secondary cardio-vascular condition.

The effusion, if large, gives rise to a triangular area of dullness to percussion at the adjacent part of the base of the sound lung, due to pushing over of the mediastinum and encroachment of the fluid beyond the middle line of the thorax. This area goes by the name of Grocco's triangle.

On **Auscultation** friction-sounds are often audible at the limit of the effusion (particularly in children), and again more extensively as the fluid disappears ; and, strange to say, this ' redux friction ' is often unaccompanied by pain. The breath-sounds are inaudible over the dull area if the fluid is at all considerable in amount, and weak, distant, and possibly subtubular, if there is only a little fluid. I am dealing now with the condition of things as present in the adult. Baccelli's sign is, I think, of but little, if any, use except in children. Vocal resonance is much diminished and usually lost.

At the extreme limit of the fluid, and over the adjacent part of the lung above, the breath-sounds are more distinctly tubular, and ægophony is often present ; also a few moist crepitations may not infrequently be heard, without the case being necessarily complicated with pneumonia or tubercle, but due to a slight œdema from a certain amount of compression.

As regards the question of mensuration by the cyrtometer, personally I do not set much value upon this. The right side is normally a little larger than the left, and this 'little' is a variable quantity. If, however, the left side is the larger by measurement, then this sign is of more value, but right-sided enlargement as a sign of right-sided pleurisy with effusion is very doubtful. Also a considerable amount of fluid may be present, and, by compressing the lung, may be accommodated without any unilateral enlargement. More reliance can be laid on obliteration of the intercostal depressions.

The diagnosis of pleural effusion has to be made from the following :

1. **Pneumonia.**—Enumerating first the chief points of resemblance, there may be bronchophony present towards the upper limit of pleuritic effusion, and below the level at which this is heard a dull note to percussion with bronchial breathing ; while, on the other hand, if the main tubes be blocked in pneumonia, tubular breathing over the part supplied may not be audible. The occurrence of this blocking is denied by many, though they can give no other explanation of the rare cases of pneumonia in which bronchial breathing fails to appear throughout the course of the disease. Again, we must bear in mind the fact that the effusion may be itself secondary to a pneumonia.

It is important, therefore, to make full inquiry into the history and course of the illness, and to note the duration of the case. Pleurisy (not complicating pneumonia) is rarely, if ever, ushered in by a rigor, or even by a definite chill, nor does the fever continue so long with such small remissions. The dyspnœa in pleurisy is due largely to pain and fever, and only later from embarrassment of lungs and heart, whereas in pneumonia it is more severe, with dilating nostrils, bright flushed face, grunting expiration, and due to toxins which are largely responsible for both the dyspnœa and the fever (usually, though not invariably, higher in pneumonia than in pleurisy), and in less degree to the pain and loss of function of part of the lung. Finally, the character of the expectoration is distinctive.

As regards physical signs, the sense of resilience to the hand on percussion is lost where the effusion is large and the heart is displaced. This is a most important sign, which is, of course, absent in pneumonia.

Vocal fremitus, of more value in many cases than vocal resonance, is increased in pneumonia, diminished even to complete absence in pleuritic effusion. In this connection we must remember that there are some observers who state that an early sign (in fact, *the earliest sign*, according to them) of pneumonia is a diminution of the vesicular breath-sounds; but if this be the mode of onset there would not have been sufficient time for the development of a pleuritic effusion, though, of course, there may have been a 'latent effusion' for some time previous to the acute onset of a fresh illness—pneumonia. Such a condition would probably put the medical attendant quite off the track, for this diminished murmur is said to be present for a few hours before any difference in the percussion-note is evident. The engorgement of the lung and the pain necessitate lessened respiratory movement, and the resultant diminution of vesicular murmur and slight dullness on percussion may precede by some four days or so the detection of tubular breathing. All this seems to make the question a very difficult one, but careful examination will usually solve the difficulty, for the area involved at an early stage of pneumonia is quite circumscribed. For the more accurate localization of such a patch, I have sometimes found that the employment of a good phonendoscope is more suitable than the ordinary binaural stethoscope.

The line of demarcation of the limit of dullness in pleural effusion is peculiar, and may be of considerable diagnostic aid, and also Grocco's triangle of dullness is not found in pneumonia. An exploring needle even may not clear up all doubt, for in pneumonia a few drops of blood come away, and in some forms of pleural effusion—for example, that of tuberculous origin—the fluid may be deeply blood-stained. Finally, the disturbance of the normal ratio between pulse and respiration is of value.

Other points of distinction which we may find occurring in children are considered subsequently in the following paper when speaking of the differences between effusion in adults and in children, and the diagnosis of empyema in the latter.

2. **Pericardial Effusion.**—This may be very extensive, as much as 2 pints or more being present, and it is such a case which is liable to be mistaken for pleural effusion. The important points of distinction between them are :

(1) That the outline of cardiac dullness retains more or less its characteristic pyriform shape, even when the effusion is very large ; but by extension to the right, it obliterates the cardio-hepatic angle in the fifth interspace—Rotch's sign. This area is quite different from that of pleural effusion.

(2) The position of the heart is not altered by pushing over of the mediastinum, as in pleural effusion.

(3) The presence of Bamberger's sign in pericardial effusion is often of value. When the patient is sitting up, if there is a fairly large effusion (such as would be likely to be mistaken for pleuritic), about the angle of the left scapula is an area the size of a crown-piece, where there is dullness on percussion, increased vocal fremitus, and bronchophony. All these ' consolidation ' signs disappear when the patient leans forward, but return when he again sits upright.

(4) As the effusion increases, the lung is pushed aside, so that on percussion the transition to the resonant pulmonary tissue is abrupt, and the sense of resilience to percussion over the latter after the heavy dullness of the former is remarkable.

(5) The dyspnœa and general distress are usually much greater in patients suffering from pericardial effusions, and these symptoms often become suddenly aggravated without any obvious cause.

These distinctions sound all very well on paper, but even in the presence of such important and helpful diagnostic signs as an enlarged area of dullness, a diffuse or perhaps invisible impulse, and weak, distant cardiac sounds, the mistake has been repeatedly made.

The question of diagnosis from pericardial effusion in children is discussed in the ensuing paper.

3. **Collapse of Lung.**—A twofold error is possible here. Firstly, the dull area may be of considerable extent, and

effusion diagnosed where there is merely collapse; and, secondly, collapse of lung may be diagnosed as the only cause of the physical signs, while the effusion, more than probably purulent, which was itself the cause of the collapse, is not recognized.

If acute, the symptoms at the onset may be those of bronchitis with fever, which, especially in children, may be high, a cough, dry and harsh for the first day or two, and within forty-eight hours, through plugging of a bronchus, collapse may occur, with diminution of breath-sounds and dullness to percussion, signs likewise of pleuritic effusion. The condition of obstruction of the bronchus, however, clears up early, as a rule, and the typical signs of bronchitis become evident. In chronic collapse of lung fluid may coexist, otherwise the diagnosis is not usually difficult, since the heart and mediastinum, instead of being pushed over to the sound side, are drawn over to the affected one. It must be borne in mind, however, that for a considerable time after the fluid has disappeared, either from aspiration or absorption, dullness to percussion may remain.

4. **New Growths.**—Not infrequently a pleural effusion exists in association with a new growth, and the combination of symptoms may be very puzzling. Signs of fluid, however, are present, and after removal of this, the physical examination will reveal the nature of the condition, or will at least show that we have something more than a mere uncomplicated effusion to deal with. Diagnosis will be greatly aided by attention to the following points, taken together:

(1) If the patient be at or above middle age, and emaciation has progressed since the onset of the first symptoms, we must be on the look out for other signs of new growth. In children progressive emaciation may be the only sign of a pleuritic effusion. I have notes of several patients who were brought to me by their mothers, the statement being in each case that the child had been 'falling away.' This emaciation had in many been thought to be due to worms, and treated accordingly; but as the child did not pick up, the idea that it might be consumptive was next entertained. Examination revealed effusion into the pleura, often of long standing. Some cleared up altogether after aspiration, others only on repetition of this operation; in some the effusion was purulent, and in a few cases the condition, having been present

too long for recovery to take place, went gradually from bad to worse.

(2) In older patients a history of the primary disease may be given, such as an operation previously for mammary carcinoma, and we may thus be put upon the scent, and enlarged glands may be felt in the axilla or above the clavicle.

(3) Prune-juice expectoration, or that resembling red-currant jelly, is almost characteristic of pulmonary new growth; but it may occur in early breaking down of lung tissue in cases of chronic pneumonia—in fact, where there is a certain amount of blood stasis in an œdematous lung. I have seen one case in which this symptom was due to the opening of a suppurating hydatid cyst of lung into a bronchus.

(4) Lastly, there is often found a mingling of the physical signs of pleural effusion and pulmonary consolidation in neoplasms of the lung, these occurring in irregular areas, the signs of effusion being, perhaps, almost entirely anteriorly and none posteriorly. Pressure signs and enlargement of the veins of the thoracic wall are often present also, and the effusion, when drawn off, may be hæmorrhagic. This, however, is not always the case, for it may be found in tubercle, and rarely, it is said, in primary inflammation of the pleura in an otherwise healthy subject. I have never yet met with such a case.

5. **Phthisis.**—The following are some of the reasons on account of which a pleural effusion, especially one that is purulent, may be wrongly diagnosed as tuberculosis of the lung:

(1) Effusion at the base of a lung may, as stated earlier, compress it and cause tubular breathing at the apex, or, if the amount of fluid is small (in children even if large), there may be dullness with bronchial breathing over the area itself, signs similar to those found in pulmonary consolidation. In rare instances an empyema may be shut off and confined to the apex of one side, when the mistake is still more likely to be made.

(2) The pus may make its way internally and open into a bronchus, when the symptoms and physical signs may simulate those of a tubercular cavity, though this is not often the case.

(3) In a condition of empyema, as when pus is locked up

anywhere in the body, fever, emaciation, and sweatings occur, signs also of tuberculosis.

Points to be relied on in distinguishing between phthisis and effusion into the pleura are : the increase of vocal resonance in the former, the scattered and mixed character of the physical signs, and the presence of the tubercle bacillus. Though this last is, of course, decisive as a positive result, many preparations may have to be examined, and even repeated failure does not exclude tuberculosis. I have more than once stained a dozen cover-glass preparations, and have almost made up my mind that the signs present must find some other explanation, when one more attempt has shown a field with several bacilli.

Displacement of organs is most important to look for in this connection, especially displacement of the heart, or, rather, the mediastinum, and with it the pericardium. The heart thus is pushed laterally and slightly tilted up.

Other methods of diagnosis which may come into vogue are :

(1) The employment of tuberculin, of which I have no personal knowledge.

(2) The agglutination method, or serum diagnosis, of which I have had a little experience, but quite insufficient to gauge its value.

(3) Lastly, the use of X rays. I was for more than eighteen months in charge of the X-ray department of the Military Hospital at Maritzburg, and had ample opportunity of studying this method. I am sorry to say that I did not find it of much use. I am speaking of three years ago. There have probably been many improvements since then, but except in cases where the physical signs were almost positive, the confirmatory evidence of X rays was very meagre.

The mistake of diagnosing purulent pleuritic effusion as tubercle is more likely to arise in the case of children than in adults. The reasons for this are dealt with subsequently.

6. **Aneurism.**—A pulsating empyema, or a left-sided empyema which is pointing, may resemble aneurism ; but in the latter various murmurs synchronous with the beat of the heart may be audible, also the area of dullness on percussion is circumscribed, while that of pointing empyema is usually basally situated, not near the median line, and the pulsation is influenced by movements of respiration.

A pleural effusion which pulsates is said to be almost invariably purulent. I have only seen a few cases, and in every one of those empyema was present. Two were of small size, the pulsating area occupying the sixth and seventh spaces anteriorly, and one was high up in the axillary region. All three were on the left side, and although the area of pulsation was small, the amount of effusion was in every case large, and removal of part of it caused a disappearance of the pulsation.

7. **Hydatid of Lung or Pleura.**—In spite of the stock signs and symptoms of this, the diagnosis is not often made, unless there are such unmistakable signs as the presence of small hydatids in the sputum, or fragments, should a cyst rupture. The difficulty is increased by the fact that their presence may cause an associated pleurisy with effusion, and suppuration of a cyst may result in empyema. If not thus occurring together, the chief diagnostic points would be the absence of fever, the less urgent dyspnœa (probably due to accommodation, as growth is slow), and the outline of the dull area. This last is not of much service, as more than one cyst may be present, and cause irregularity of outline. Puncture in exploration would make the diagnosis sure, but, as I have reported elsewhere, exploratory puncture of a hydatid cyst in the lung is not always a simple matter : it may be fraught with great danger. The case I refer to was mistaken, as so many are, for pleural effusion. An aspirating-needle was thrust in, and the patient died in a few seconds. The wall of the cyst ripped up, as it were, from the place of insertion of the needle, and the fluid escaped into the lung and practically drowned the patient.

8. **Diagnosis from Thickened Pleura,** if the degree of thickening is considerable, is not, I think, possible, except by the use of the exploring-needle, unless the affected side is contracted in consequence. All the signs of fluid are present—viz., diminution of movement, dullness to percussion, absence of vocal fremitus, and vocal resonance, etc. In the case mentioned in the early part of this paper the signs after the third tapping had remained *in statu quo*, and further explorations since have failed to reveal the presence of any fluid.

9. **Subphrenic Conditions,** such as abscess or hydatid of liver and subphrenic abscess. Affections of the upper surface of the liver, such as abscess, may be, and often are,

associated with a pleural effusion. The diagnosis in these cases between enlargement of the former, apart from the existence of the latter, is a difficult matter, for the dullness on percussion will be continuous from the one to the other. The outline of the upper limit of the dullness may sometimes be a help, and in enlargement of the liver the lower ribs on that side may be everted. In hydatid of the right lobe the liver may be pushed downwards and the heart displaced to the left. The outline of dullness is usually convex above, the highest point being the posterior axillary or adjacent scapular region. The characters of the fluid on making an exploratory puncture will be of great service: the specific gravity will be low, it will contain no albumin, and, microscopically, hooklets may be found. We should always bear in mind the possibility of such an occurrence as that already mentioned in exploring hydatid cysts, especially where the lung is concerned, though I feel sure such an unfortunate result as that cited must be rare. Nevertheless, it behoves us to try to settle the diagnosis by other means if possible before resorting to exploration in a dangerous area.

Subphrenic abscess is often associated with basal pleuritic effusion, not infrequently purulent. Dullness at the lower part of the lung may be due to this or to compression and collapse of lung from thrusting upwards of the diaphragm. The heart is not displaced laterally. This is a most important sign, which I have dealt with in greater detail in another paper on the 'Diagnosis of Subphrenic Abscess.'

A small supradiaphragmatic empyema—that is, one situated between the base of the lung and the diaphragm—may cause a considerable amount of collapse of lung, and cannot by physical signs alone—unaided, that is, by reference to the history of primary abdominal trouble—be distinguished from the condition when secondary to subphrenic abscess.

2. The Diagnosis of Pleural Effusion and Empyema, more particularly considered with Regard to the Condition in Children.

The present short paper, which, as already stated, is to be regarded in the light of a sequel to the foregoing, deals with the differences between the signs of pleuritic effusion in adults and those which may be found when the same condition occurs in children, and later, with the question of the diagnosis of purulent pleuritic effusions.

Let us now review the physical signs as found in children. Firstly, inspection will reveal that one side is moving less freely than the other with respiration. A casual observation of this is not sufficient, for young children in health will for a short time show irregular movements in breathing, just as in other muscular actions, and frequently they will be seen to breathe for two or three respirations with one lung almost entirely, the other remaining nearly motionless. The affected side is more usually smaller than the sound one, and not larger, as may be the case in adults, though, as was mentioned in the previous paper, the apparent increase in the affected side in adults is often deceptive, and even where the enlargement seems to be considerable actual measurement may show but little increase. Also, in the majority of adults the right side is by measurement larger than the left, making this sign of still less value in right-sided effusion, whereas in children below the age of five years (in whom a purulent effusion is twice as frequently found as a non-purulent one), this difference between right and left sides normally is less evident. The affected side in moderate effusions is often, in children, smaller than the sound one, and this point constitutes a marked difference from what we are accustomed to see in adults. This is probably due to the elasticity of the chest-wall and a certain amount of compression of lung.

Absolute dullness and sufficient displacement of the heart to warrant a diagnosis being made from these signs are not commonly seen. A very suggestive sign is skodaic resonance at the upper part of one lung. This, of course, may be due either to pleural effusion below, to pneumonia, or to tubercle. On percussion lower down towards the base on the same side the note becomes more and more impaired, but unless the percussion is very gentle, absolute dullness may not be obtained, although a good deal of fluid be present, and in examining children percussion should always be gentle. It follows, therefore, that more than a modified resonance of note must not be expected, even though fluid in considerable quantity be present. This is an important point in contrasting the condition in children with that in adults, and one which is very often lost sight of. I have repeatedly heard it said that exploration for fluid was but ‘ meddlesome surgery,' because there was no possibility of fluid being found, seeing that the note on percussion was not dull.

Again, in children the vesicular murmur is rarely lost with ordinary serous pleuritic effusion. It is true that the murmur may be lessened, but even with a large effusion it is practically never obliterated. If the pressure results in a partial compression of lung tissue, then the subdued vesicular murmur becomes more a bronchial sound, while compensatory respiration on the sound side results in the production of ' hyperpuerile ' breath-sounds there.

Finding, therefore, skodaic resonance over the apical region of a lung and diminution of the percussion-note at the lower part, together with subtubular or distant vesicular murmur, we often have to be therewith content, and the diagnosis of the presence of fluid is usually correct.

Baccelli's sign, which, as I have previously stated, is not of much value in adults, is in children a significant subsidiary sign that pus is present, or, in other words, that we have to deal with an empyema and not a simple effusion.

When speaking above of the signs which may characterize the affection in children, I stated that tubular breathing over the upper part of the lung (or at least harsher, subtubular breathing) may be caused by pressure of fluid at the base. This introduces yet another difficulty, since, if a too cursory inquiry be made into the history, and the physical signs present in different parts of the chest be not carefully studied, an erroneous diagnosis of pneumonia may be made. But in these cases the effusion has been some time in forming, and fever, if present, is not high. The mistake would, therefore, in all probability only be made by one who had omitted to examine thoroughly the whole chest. While I was medical officer in charge of the Children's Hospital, Maritzburg, in 1903-04, cases were frequently sent up diagnosed as pneumonia or tubercular consolidation of the apex, which, on detailed examination, revealed signs of fluid at the base. I make it a rule, therefore, when called in to see a child to examine every part, and the chest particularly thoroughly, having the patient stripped if possible. The proceeding takes a little longer, but is infinitely more satisfactory, and saves one from many mistakes.

Pericardial Effusion.—Erroneous diagnosis between pleural and pericardial effusion is not often made in the case of adults, for the points of distinction are in most cases fairly definitely established. These have already been dealt with in sufficient detail in the previous paper, and may, therefore, be dismissed now with mere enumeration :

1. The pyriform outline of cardiac dullness, with Rotch's sign of obliteration of the cardio-hepatic angle in the fifth right intercostal space.
2. The heart retaining its normal position, and not being thrust aside with the mediastinum, as will be the case with extensive pleuritic effusion.
3. Bamberger's sign of 'consolidation' at the angle of the left scapula, disappearing when the patient leans forward, but returning when he resumes the upright position.
4. The absolutely dull note over the pericardial effusion passing abruptly into the resonant pulmonary note.
5. Weak, distant, muffled heart-sounds.
6. Sudden and apparently causeless attacks of dyspnœa and distress, or exacerbation of the distress already present.

But on consideration of the condition of things in children, the diagnosis may be most difficult, for a left-sided pleurisy (and pleuritic effusion in the young is very liable to be purulent) often spreads to the pericardium, so that empyema and purulent pericarditis may coexist. The constitutional symptoms are marked, and the dyspnœa and distress very great.

The question may be still more complicated by the fact that in children the heart dilates much more readily than in adults, the myocarditis which is present is more extensive, and often there is a considerable area of atelectatic lung at the bases, so that we may find a comparatively large extent of dullness from pericardial effusion, dilatation of the heart, and atelectasis. But in children, even if the fluid be in considerable amount, friction-sounds over the large vessels at the reflection of the pericardium are nearly always heard. They are not obliterated as readily as in adults, and the valvular sounds, though blurred and embarrassed, are still audible, and often accompanied by murmurs from relative inefficiency owing to the dilatation of the heart, coupled with endocarditis, which is usually present, particularly if the disease be rheumatic in origin.

Diagnosis from Collapse of Lung.—This may not always be an easy matter. If the case be one of congenital atelectasis, or the condition be of long standing, the displacement of the heart to the affected side would be sufficient of itself to establish a diagnosis. If, however, the condition of things was of recent origin, the question becomes much more complicated, for pleurisy and bronchitis may have coexisted and collapse may have followed from plugging of bronchi in the latter or pressure of fluid in the former.

The main point, short of actual exploration, which would be of greatest service here is the persistence in children of breath-sounds through fluid, and frequently the audibility of bronchial breathing ; for, as already stated, if the compression by fluid has resulted in a certain degree of collapse of lung, bronchial breathing will be audible, whereas if due to bronchitis and plugging of bronchial tubes, there will be absence of breath-sounds over the area involved. In such cases, again, a good phonendoscope, by allowing a smaller area to be examined at a time, is often, in my opinion, more valuable than the ordinary stethoscope.

Diagnosis from the Results of Pressure by Enlarged Bronchial Glands.—This implies the possibility of the recognition of enlargement of these glands, for the result of the pressure is collapse of lung tissue, which has just been dealt with. The recognition of enlargement of the bronchial glands is often a question of great difficulty, except in tuberculous children, when we can nearly always prophesy with safety that enlarged and caseous glands will be found post-mortem. Apart from this, the likelihood of our proving right after voicing such an opinion is, I think, very doubtful, unless such obvious signs as paroxysmal coughing, stridor, pressure on the innominate vein, the vena cava superior, the recurrent laryngeal, or the vagus nerve itself, are present.

As my own experience in this matter is but small, I will quote in a few words what some of our best authorities have said on the subject : ‘ In the absence of tubercle, a large majority of cases of enlargement exhibit no symptoms, and the enlargement subsides with the disappearance of the primary disease causing it, such as measles, scarlet fever, pertussis, broncho-pneumonia ’ (Lindsay).

Eustace Smith (quoted in Keating's ‘ Encyclopædia of the Diseases of Children,’ vol. ii., part 2) states : ‘ If the child be directed to bend his head backward upon his shoulders, so that his face is turned upward to the ceiling, a venous hum, which varies in intensity according to the size and position of the swollen glands, may be heard with the stethoscope placed upon the upper bone of the sternum. As the chin is slowly depressed again, the hum becomes less distinctly audible, and ceases shortly before the head reaches its ordinary position. The explanation of this phenomenon appears to be that the retraction of the head tilts forward the lower end of the trachea. This carries with it the glands lying in its bifurcation, and the left innominate vein is compressed where it passes behind the first bone of the sternum. I believe this explanation to be the correct one, for in cases of merely flat chest, where there is no reason to suspect enlargement of the glands, the experiment fails. Nor, again, can the hum be produced in the healthy child by the thymus gland. This gland lies in front of the vein immediately behind the sternum. Enlarged bronchial glands lie behind the vessels in the bifurcation of the trachea. A swelling in front of the vessels does not appear to be able to set up pressure upon the vein when the head is bent backward in the position described.' Also, ' Pressure on the descending vena cava or the left innominate vein gives rise to a hum, and on the pulmonary artery to a systolic murmur heard best at the second left interspace. But long before the ordinary signs of pressure on the vessels can be detected, we can induce pressure on the vein if the bronchial glands are enlarged. This sign is one of the earliest indications of disease of these glands.'

On the other hand, according to Professor Henoch (' Lectures on Children's Diseases,' vol. i., p. 442) : ' The clinical descriptions which authors give of glandular enlargement have the look of having originated in the study, and not at the bedside. It is said that the compression exerted by the glands on the neighbouring parts might readily give rise to pressure symptoms, and, in fact, cases do occur in which œdema of the face and dilatation of one or both jugular veins in the neck take place, and likewise hæmoptysis and hæmorrhagic infarction of the lung from pressure on the pulmonary veins.' He here goes on to quote a case in point, and continues : ' I must, however, regard such cases as extremely rare. We have often at post-mortems found large masses of caseous bronchial glands, the presence of which had not been revealed during life by a single symptom, the children having presented nothing beyond the well-known features of tubercular meningitis or phthisis. Even the distension of the external jugular veins, to which so much importance has been attached, and the œdema of the face, may occur merely as the result of engorgement of the right side of the heart from extensive consolidation of the lungs, without there necessarily being any compression of the large venous trunks within the thorax. On this account I regard the diagnosis of enlarged glands during life as very problematical. I would, however, attach least value of all to the dullness of the percussion-note over the interscapular region, which many insist upon. I at least have never yet seen a glandular tumour so large that it could have caused a well-marked dullness in this locality.' Again, later : 'In most cases the condition can only be suspected, and is therefore merely of pathological interest. Only in exceptional cases can we make a diagnosis with any degree of probability when there are distinct symptoms of pressure on the veins or on the vagus nerve.'

This question, therefore, surrounded, as we see, by difficulties, need not detain us longer—in fact, the point has only been introduced for the sake of completeness.

We come now to the second question which we have to ask ourselves in attempting to decide as to the presence of pus in the pleural cavity—viz., Having concluded that there is pleural effusion, is that effusion purulent ? This will not detain us so long.

The points for consideration in this connection may be grouped into those based upon the history and those upon the objective signs and symptoms.

Firstly, then, the **history.** The age of the patient is important, for in children empyema is very common. The effusion is amongst the young much more frequently purulent from the outset than is the case in adults (about 67 per cent. in children under five years of age are purulent, as compared with 25 per cent. in adult life (Samuel Gee, in Clifford Allbutt's 'System of Medicine,' vol. v., p. 247). The majority appear to be due to the pneumococcus, associated occasionally with, though not directly due to, the *Bacillus tuberculosis.* It would seem that the lung tissue is softened at least, if not broken down, by the action of the tubercle, and by way of this weakened tissue the organism (pneumococcus in most cases) passes to the pleura.

The early signs of pleurisy in children are often indistinct, possibly owing in part to their inability to point out their complaints ; but in some cases the onset is very acute, with intense pain, vomiting, shivering, possibly a convulsion, and high fever. Cases starting thus violently usually show pus early in the course of the disease, and not a few seem to be purulent from the outset. We must not be too easily led away by the existence of fever in children with pleurisy. I have known several cases in which the temperature kept up for four, and in one case even for six, weeks without either pus or tubercle being present. On the other hand, a very long-standing empyema may exist, possibly shut off or cretified, without there being any elevation of temperature. Again, in children pleuritic effusion is not by any means an uncommon complication of scarlatina and rheumatism. In the former the effusion is more frequently purulent, while in the latter it is sero-fibrinous in the majority of cases.

The duration of the illness is by some considered to be an important point, but I have seen so much variety in this that, in my opinion, we should not lay much stress upon it. As already stated, I have seen a child of five years of age with pleurisy continue to have a temperature rising to 100° or so for six weeks, and then clear up altogether and remain well. More than one examination during that time failed to reveal any collection of pus, nor were any signs of tubercle detected in the lungs or elsewhere, and no history of that disease was obtainable. One had always been taught previously that a lengthened duration of this illness was a more or less certain indication of the presence of pus.

In adults, however, the existence of pyrexia is a much more important symptom. As soon as the effusion becomes purulent, the temperature becomes elevated, and later remittent, with shivering and perspiration, each abrupt rise being ushered in by a chill, possibly by a definite rigor, and each fall being accompanied by a profuse perspiration. This is particularly the case if the pus be pent up.

Pallor may be marked and emaciation rapid. In children this is a valuable symptom. A child was brought to me with a history of a mild attack of scarlet fever, followed by a troublesome cough in convalescence, accompanied by a slight pain in the chest. Since that time, about ten to twelve weeks from the onset of the fever, and six or seven from the appearance of the cough, the child had rather rapidly lost flesh, and the parents feared that he was ‘ going into a decline.’ He had peculiar and puffy features. I suspected renal mischief as a sequel of the scarlet fever, but the urine was normal on examination. There were signs in the chest of effusion into the pleural cavity, and on exploring pus was found. This was evacuated, and the patient made a good recovery. This puffiness of the face in children is not uncommonly present with empyema, and may be found with sero-fibrinous exudation of some standing. In fact, one of the best authorities on diseases of children (Dr. Still) used to lay down the rule that pallor and puffiness of the face, in the absence of renal disease and whooping-cough, were valuable signs of large pleural effusions, possibly, but not necessarily, purulent.

The physical signs of empyema, in addition to those already dealt with, are two in number. Firstly, there may be some local œdema of the thoracic wall. This is rarely seen in adults, unless the abscess is pointing ; it is not so uncommon in children. Secondly, Baccelli’s sign—viz., that whispered voice-sounds are transmitted over serous effusion, but not if the fluid be purulent. This, as already stated, may sometimes be of use in children, but rarely holds good in the case of adults. With these exceptions I do not think that there is any sign, excluding actual puncture, of real distinctive value on which one can rely for stating whether the fluid present is serous or purulent.

Lastly, exploratory puncture is in most cases the only true guide, and even here more than a single puncture may be required. For if the empyema be a loculated one, the needle may not strike it ; if small, it may pass through and beyond the collection into the lung, and it is quite conceivable that pus might be drawn thus from a bronchus or a cavity. Again, the pus may be too thick to be drawn into the needle, and unless a second attempt were made with one of larger bore, its presence may be overlooked.

I have tried to bring into greater prominence in these last two papers the means at our disposal whereby we may arrive with more certainty at a decision as to the presence of fluid, serous or purulent, in the pleural cavity, before making an actual exploratory puncture. Having an almost infallible method ready to our hands—namely, puncture—we are inclined to make light of other helpful, though less certain, indications. This, I think, is a pity. The matter is not so important in hospital work as in private practice, for, as all general practitioners are aware, it is not always an easy thing to get patients, or their parents in the case of children, to consent to even such a small operation as an exploratory puncture, and if two or three attempts to find suspected pus are made without success, the adult patient is inclined to think that the doctor is bungling, while the parents of a child may resent what they describe as 'unnecessary torture.' Even if, at the second or third attempt, pus is obtained, they will not improbably ascribe the first failure to carelessness or to want of precision, and, knowing nothing of the difficulties, will ask why the doctor did not make the attempt at the last place first, and so save unnecessary pain. For these reasons, therefore, I think it wiser to study and weigh carefully the significance of these subsidiary signs, and to regard the thrusting in of a needle more in the light of 'confirmatory' than 'exploratory' puncture.

One final word : We must never forget that pleural effusion is often a complication secondary to some inflammatory condition of the lung, such as tuberculosis, pneumonia, abscess, or to some subdiaphragmatic affection. Before we come to the decision, therefore, that the pleural condition is primary and the 'be-all and the end-all' of the ill-health of the patient before us, it behoves us to see that our examination is thorough, both of the chest and abdomen, and that we do not neglect to stain the sputum for tubercle, if any can be obtained, expectoration being rare in the young.

It is, indeed, a true saying that more mistakes are made from indolence than ignorance, from want of examination than want of knowledge.

IV

ON THE DIFFICULTIES IN THE DIAGNOSIS OF SOME CASES OF DISSEMINATED SCLEROSIS

We are all well acquainted with the typical advanced cases of disseminated sclerosis, presenting the spastic form of paraplegia, with increased knee-jerks, possibly ankle and patellar clonus, with jerky intention tremor, lateral nystagmus, scanning, staccato speech, and a general sense of well-being and contentment. Such it is not my intention to discuss: these cases are well known to every qualified medical man.

We are taught in hospital to regard this complaint as a very chronic one, with remissions in its downward course, terminated by some intercurrent malady, such as exhaustion from cystitis when the bladder and sphincters become involved, or pyæmia from infected bed-sores, or chest troubles when the patient becomes bedridden, or with signs of bulbar palsy. But by no means uncommonly, on obtaining a detailed history, we find that the initial symptoms may have been in evidence years previously; but things have so cleared up that these early signs are almost forgotten—at least, by the patient—and the disease appears to start afresh, run a rapid course, which may even end fatally, or may again partially clear up. These rapid exacerbations are frequently seen, but not commonly proceeding to a fatal issue. Thus, I recollect one case where the patient developed rapid paraplegia and amaurosis; the bladder soon became involved, and delirium supervened—in fact, the patient exhibited signs of an acute encephalitis necessitating removal to an asylum. This was a soldier in whose case no history or sign of syphilis could be found. After a time—I forget how long—these symptoms to a great degree cleared up, and when I saw him again some two years later he only showed some weakness of legs, the right being more affected than the left, and in the right ankle clonus was present. There was also nystagmus, typical scanning speech, and pale optic discs.

The ordinary division into three types—cerebral, spinal, and cerebro-spinal—being to a certain extent a clinical division based on symptoms, is right enough as far as it goes, but I think it is unsatisfactory in not going far enough to meet the difficulties of diagnosis in early cases and the appearances at the onset, or when patients first seek for treatment. A more detailed classification from the clinical aspect is needed to enable us to recognize, or at least be on the watch for, this disease at an earlier stage of its course than is usually done.

One of the greatest difficulties, if not the greatest of all, arises from the fact that the symptoms of this disease are so variable, and that in different patients one or even all of the cardinal symptoms on which one is taught to rely as a student —viz., volitional tremor, scanning or staccato speech, and nystagmus—may be absent.

It is true that in a large number of patients the cerebral or psychical symptoms for a long time predominate, while in others these may be so slightly marked that they are overlooked, and the symptoms are almost entirely spinal. But even in the latter case, though the *clinical* picture is practically that of exclusively spinal mischief, nevertheless *pathologically*, post-mortem, if a thorough examination be made, changes will nearly always be found distributed throughout the central nervous system.

Again, if the subdivision into the three types mentioned be adhered to, under which could be placed those cases in which there are found signs of affection of the peripheral nerves ? For both spinal and cranial nerves may be involved, and in some cases minute examination fails to reveal implication of the nuclei of these nerves.

For these reasons, therefore, and others of which time forbids me to speak in detail, I think further subdivision is necessary. For purposes of diagnosis, we want something definite to go by in the earlier stages of this disease ; for it is early in the affection that greatest difficulty exists, that mistakes are most likely to be made, and reputation for diagnostic acumen lost. Patients do not like to be told (and surely it is only natural) that their disease is an obscure one, and that no definite opinion can be given at present ; and in the affection under consideration, where progress may be slow, and where temporary ameliorations take place, the question of diagnosis cannot be set aside month after month, and even if the outlook be a bad one, the patient will in most cases prefer to know the worst, and to have his disease labelled, rather than drag on in uncertainty, feeling that the doctor is not quite sure, and that he may, therefore, be treating him for some disease which he has not got, as he will most likely state it, even though treatment may in either case be of little or no avail.

I venture to suggest the following classification, for the majority of, if not all, cases can be placed under one or other :

1. Patients who exhibit ‘ hysterical symptoms.’
2. Those with eye symptoms or signs, for the patient may not make any complaint of defect, while accidentally, as it were, examination may reveal changes in the disc.
3. Patients whose main complaint is ‘ giddiness.’
4. Those suffering from fits of an apoplectic type.
5. Those with spastic symptoms.
6. Those with ataxic symptoms.
7. Cases presenting obscure nervous symptoms, often of an anomalous character.

1. **Patients who Exhibit ‘ Hysterical Symptoms.’**—As regards the first of these, I have met with at least two cases in which there was every excuse in the early stage for the diagnosis of hysteria. In the first, peculiar nervous symptoms, numbness of the calf of the right leg, associated, according to the history, with temporary loss of power in the limb, followed exposure to wet in a thunderstorm. This weakness of the limb used to pass off rapidly, and on examination there was, it is true, some localized anæsthesia, but very slight, if any, appreciable loss of power could be detected, though after a fairly long walk the patient seemed to drag the limb slightly and to limp a little. In the other, who was regarded by the medical attendant and some members of her family as an hysterical subject, there was given a history of sudden loss of voice shortly after an emotional upset—I think in connection with the breaking off of an engagement, or some love affair. The voice came back soon afterwards, so report said, but subsequently the aphonia abruptly appeared again. In

both these cases, as time went on, the cardinal symptoms of disseminated sclerosis became evident.

I fear that, had I been called to this latter patient in the first instance, I should have fallen into the same error ; but on going more deeply into the history in each case, the symptoms were found to have been present, though truly in a less degree, before the event which had been regarded as the exciting cause, and, moreover, as stated in the history of the former, the symptoms did not totally disappear during the after remission. The first patient, I may confess, was taken from my care to that of another practitioner, because the parents scouted my statement that the condition was not altogether hysterical, and they considered that my diagnosis was wrong, and that speedy cure should have resulted. This happened some six years ago, and the patient within a couple of years became much worse, and in disgust this time with the doctor who had agreed with them that the case was merely one of hysteria, the parents, with the sweet unreasonableness of a nervous patient's friends, again called me in, when the patient exhibited the tremor, nystagmus, and halting speech of typical insular sclerosis.

The difficulty of diagnosis from hysteria may be very great, particularly in the early stages. The symptoms are similar in kind, for paralysis may occur in both ; intention tremor and scanning speech are found sometimes in hysteria, though very exceptionally (as also in tabes), and, as in the cases mentioned above, an emotional upset may be given as the starting-point, and finally, though the case be one of the more serious organic diseases, the paresis may at the stage of which we are speaking pass away perhaps for quite a long period.

I have said advisedly 'similar in kind,' for they are not, as a rule, similar in degree. Thus, hysterical paralysis is often absolute from the beginning, whereas in multiple sclerosis it is incomplete at first, and if contractures become established they develop slowly, while in the former they may appear suddenly. Again, the numbness of disseminated sclerosis is rarely found in the early stages on examination, whereas the anæsthesia of hysteria is objective, and may be very extensive, even to hemianæsthesia. Babinski's sign is not present in hysteria ; it may be found in disseminated sclerosis.

The tremor of hysteria, though similar, is in some respects not quite the same. It is not such a definite volitional tremor, and this fact may be brought out by getting the patient to write. On the other hand, this sign, as already stated, may be absent in disseminated sclerosis.

Eye symptoms are most important from the aspect of diagnosis. One has seen a jerking of the eyes in hysteria, associated not infrequently with a certain amount of blepharospasm, but true nystagmus I do not think is ever found. Also, although there may be limitation of the field of vision, no fundus changes are present in hysteria. Again, in insular sclerosis the muscle first paretic may be one of the external eye muscles, leading to a transient strabismus. This, so far as I am aware, does not occur in hysteria, except possibly during a convulsive attack.

Since the above was written, I have met with the following statement : ‘ With regard to affections of the muscles of the eyes . . . in hysteria these are generally due to spasm. Conjugate deviation of the eyeballs may occur during or after a fit, but is seldom of long duration, and never permanent. . . . It is doubtful whether paralysis of an oculo-motor muscle ever occurs ’ (‘ Hysteria and Neurasthenia,’ pp. 72, 73, by J. Michell Clarke, M.D., F.R.C.P.).

The state of the knee-jerks is a guide only occasionally, for it is rare to find loss of these in disseminated sclerosis in an early stage ; though in one case I met with it was of use, for the jerk was absent on the one side only. True ankle clonus does not occur in hysteria. If, as is occasionally seen (I have observed it twice), absence of knee-jerk associated with ankle clonus be found, organic disease is certain.

Babinski's sign is, in my opinion, of much value, for it must be very rare for the pyramidal tracts to escape altogether the scattered islets of sclerosis.

Finally, in cases where there are undoubted hysterical symptoms, we must never forget that underlying these there may be an organic basis.

I had the good fortune to see one case which, if the whole were organic in origin, must, I think, be rare ; but the condition may perhaps be regarded as in part hysterical, founded upon an organic basis. It was a case in which the tremors did not involve a whole limb, but were merely segmentary. The patient, a man, had complained of a feeling of weakness and stiffness in the right leg. On examination, the knee-jerk on this side was increased, but, strange to say, there was also right-sided hemianæsthesia. No nystagmus was found; the left grip was not so strong as the right, although the patient was left-handed, and on attempting to raise a small object, the hand and fingers, not the rest of the arm, showed some tremor. The speech was rather deliberate, but not definitely staccato. Shortly after, the hemianæsthesia passed away, and some months later, when I again saw him, the speech was scanning in character. On re-examination, the knee-jerks were both exaggerated, and the gait was swaying and spastic. On attempting to raise and drink from a glass of water, considerable difficulty occurred in grasping the glass. The tremor, which was not seen when the hand was at rest, became marked; but having once taken hold of the glass, the patient could bring it directly to the lips without tremor or spilling any of the contents. The muscles of the upper arm, therefore, were obviously not affected. Similarly, he experienced great difficulty in picking up a pen, but having once accomplished this, he could draw a line with a ruler by moving the whole arm.

2. **Cases with Ocular Symptoms.**—In some instances a slight dimness or mistiness of vision may be the first manifestation of multiple sclerosis, but by the time this is complained of there will usually be detectable signs in the fundus—namely, pallor of the disc, slight it may be, but nevertheless present. It is astonishing how far this condition may advance unnoticed by the patient—that is, it may be discovered only by accident. In illustration of this fact, I will quote a case which occurred in my own practice. A young man was brought up to me with a history that something—a piece of grit, he thought—had entered the left eye, and that he was practically blind as the result. I removed the foreign body, but he still stated that on closure of that eye he could see very little with the other, the right. He never remembered any previous trouble with his sight. On examination with the ophthalmoscope, it was seen that there was considerable atrophy of the other disc, and that the patient had been, to all intents and purposes, relying on the left eye without being aware of the fact; and when the foreign body rendered this left eye *hors de combat*, attention was thereby called to the affection of the right.

The field of vision and colour-fields should also be tried in cases where there is any suspicion of disseminated sclerosis. In nearly half the cases (it has been said by Uhthoff, who has specially studied this point) there is peripheral diminution of the field, and in about the same proportion a central scotoma for colours, due to sclerosis involving the papillo-macular nerve fibres.

But whereas some patients will present themselves with a history pointing to eye trouble, and definite signs may be found on examination, others may complain of ocular trouble, and no fundus changes may be discovered ; and in yet another class pallor of the disc may be found, but the vision nevertheless appears normal. The former is explained by the possibility of the optic tract beng affected behind the eye, the resulting atrophy at the fundus not having had time to develop. In the latter, if the condition be in an early stage, and one eye only be affected, the limitation of vision is not noticed by the patient, and may be overlooked till comparatively late in the course of the disease.

Nystagmus, definite volition nystagmus—occurring, I mean, only when the eyes are moved—is of great diagnostic value ; but then, in more than 25 per cent. of cases this sign is wanting. Nystagmus, apart from congenital cases, may, of course, be found in other conditions, such as meningitis, especially posterior basic meningitis, in cerebral hæmorrhage, in tumour sometimes, in cerebellar disease, and in hereditary ataxia.

It is thus seen that there are sufficient cases of disseminated sclerosis having ocular symptoms or signs, or both, to warrant our relegating them to a more or less definite class, although it is impossible to diagnose this affection from eye symptoms alone, unsupported by other evidence.

3. **Patients whose Main Early Complaint is ' Giddiness.'**—So far as I have had experience, either in ordinary general hospitals or from cases I have seen at the National Hospital, Queen's Square, this class is not a large one. I refer to those patients in whom the vertigo is a prominent early subjective symptom. It is more frequently seen later on in the course of the disease, associated with the nystagmus. The symptom is peculiar in that it is brought on apparently by movement, and ceases during rest. The movement is not necessarily that of locomotion ; mere movement of a limb will in some cases suffice. In the early stages the vertigo may pass off for a

lengthened period, but in some patients this symptom is very persistent, and may be associated with tinnitus aurium.

4. **Those Cases Exhibiting Fits of an Apoplectiform Type.**—Of this class there is not much to be said. The attacks simulate exactly those due to cerebral hæmorrhage, except that the effects may, and usually do, pass away quite rapidly, though for a time there may be weakness unilateral in distribution, accompanied, perhaps, by aphasia. Often, therefore, the condition resembles that seen in cases of syphilitic endarteritis, where partial occlusion leads to temporary cerebral anæmia, or a thrombus soon removed, and the parts of the brain supplied are rendered transitorily functionless.

If one sees the patient in one of these attacks for the first time, the diagnosis of hæmorrhage or tumour is probably given ; but the results pass off too rapidly, and on making a detailed examination later, the speech is found to be becoming staccato, or early volitional tremor is noticed. On questioning the patient or his friends as to the condition before the attack, we shall probably be told that he had had this difficulty of speech, this trembling of the hand and arm, before the so-called 'stroke.' I have been taken in in that way once, so that now, in the absence of other probabilities of hæmorrhage, or of optic neuritis, etc., I always give a guarded prognosis, and do not jump at once to the diagnosis of the more serious intracranial mischief, such as hæmorrhage or tumour.

5 and 6. **Those with Marked Spastic or Ataxic Symptoms.**—In the early stages, of course, these are not seen. The spastic condition is a later development, but often leads to mistakes in diagnosis, for there may be in this disease a considerable variety of spastic forms of progression. The commonest is the gait of mingled spasm and weakness, the legs being partially flexed, and the feet sticking, as it were, to the ground, perhaps catching in each other when locomotion is attempted, the under surface of the toes scraping along the floor, or the great toe hyperextended, and the ball of the foot scraping. In others there may be superadded to this the condition of ataxia. I have not myself seen such a case, but one has been described to me. It seems that the abasia which is also present causes the patient to keep the feet well apart, though they stick to the floor as in the former description ; but when the patient walks, there is not only a general sense of un-

steadiness, but the control is deficient, and the feet, as soon as they are raised from the ground, are brought down again with a stamp, resembling what occurs in tabes. More rarely there is the intoxicated reel of cerebellar disease.

7. **Cases Presenting Obscure Nervous Symptoms.**—This class consists rather of a nondescript medley of cases, which cannot properly be grouped under any of the other headings; while, on the other hand, some to be detailed shortly might be removed from one or other of the foregoing, if the distinguishing symptom happened to be less prominent. Amongst these I would be inclined to place those suffering from transitory attacks of numbness and formication, loss of bladder control, and isolated paraplegia. The pathological explanation of an isolated paraplegia I hope to show at some future clinical and pathological meeting with an interesting illustrative case. There would be included also those complaining of transitory œdema of the feet, local trophic disturbances, and pseudo-sclerosis.

Passing, then, to a detailed discussion of some of the various conditions with which disseminated sclerosis may at one time or another be confounded, we will speak first of locomotor ataxy.

The chief points of distinction from this affection are, firstly, the retention and usually exaggeration of the knee-jerks, and the absence of the Argyll-Robertson pupil. Should the case be one of early tabes, there would be more difficulty, for the ataxia may be present in very small degree. The knee-jerks, however, as all are aware, are early in disappearing, whereas it is only in rare cases that they are absent in disseminated sclerosis; and when the patient is under continual observation, it will be found that in the latter case the jerk not infrequently returns, while in tabes, when it disappears, it does so for good.

As regards the eye symptoms. Paralysis, or at least paresis, of eye muscles occurs both in tabes and in disseminated sclerosis, but nystagmus is found in the latter; the light reaction is retained, and diplopia is not common, whereas one of the premonitory symptoms of the former is a transient diplopia. This is due to affection of the third cranial nerve. Involvement of the sixth nerve, leading to paralysis of the external rectus, is not nearly so frequent in locomotor ataxy, whereas in insular sclerosis it is the one most often seen. I have often found the following a help: If, when making a rapid examination, I find third or sixth nerve affection, I test the knee-jerks next ; if the former be present with absent jerks, or the latter with exaggerated ones, the probabilities are that there is tabes present in the first case and multiple sclerosis in the second. This, I admit, is a rough test, but further examination has not infrequently proved the correctness of it.

Again, amblyopia, which, as stated above, may be found in the course of disseminated sclerosis, is often unattended with contraction of the field of vision (Uhthoff's researches to the contrary; see p. 52), and tends to have periods of amelioration ; while in tabes the field is contracted, often with a peculiar zigzag outline, and the condition tends towards steady downward progress.

Secondly, ataxic paraplegia. At times there may be considerable difficulty in distinguishing this from disseminated sclerosis, but only at times, and in those cases where the symptoms are all spinal. As a rule, there is some symptom or other referable to the brain which will put one on the track. Another similarity between the two diseases is that remissions may occur in both, but practically to never such a degree in ataxic paraplegia as in multiple sclerosis, nor so frequently. It must be understood that we are not dealing now with advanced cases, for they should be readily distinguished, but with an early stage, when the sclerosis may be in such a situation that clinically a picture of ataxic paraplegia is given. In such the diagnosis cannot be made with certainty off-hand, and it would only be by watching the case, noting the remissions, and examining repeatedly for eye symptoms, that the diagnosis could be confirmed.

Thirdly, spastic paraplegia. In attempting to come to a conclusion between spastic paraplegia and the disease under consideration, again the fact must be emphasized that the eye symptoms and signs are of paramount importance.

Since disseminated sclerosis may first attack the pyramidal tracts, at this stage the affection is, to all intents and purposes, 'spastic paraplegia,' and there may be no cranial nerve or upper extremity trouble to indicate that the more widespread disease is manifesting itself. A guarded opinion must therefore be given until the case has been watched for the development of further symptoms—volition tremor, nystagmus, alteration of speech, central scotoma, etc.

Although speaking from a clinical point of view, spastic paraplegia is a fairly easily recognizable affection, or, rather, 'symptom-complex'; nevertheless, pathologically it can hardly be regarded as a definite entity. The nearest approach to it is Dreschfield's case, reported in 1881, and in this there were changes in the anterior columns, though very slight. Cases which have given similar symptoms during life are found post-mortem to show very different conditions, such as insular sclerosis, cerebral tumour, or myelitis.

In some cases the diagnosis cannot be made. A case in point comes to my mind which I heard of from Dr. Risien Russell, of the Queen's Square Hospital, and which was reported by him, of a patient suffering from a limited myelitis causing the symptom of spastic paraplegia, who, years later, showed both nystagmus and volition tremor, though to a slight degree only, and he ascribes these later results as due to mere debility and asthenic conditions following some acute disease in a patient already the subject of spastic paraplegia.

I recollect reading a short article, of which I made a note at the time, occurring in the *Lancet* some eight and a half years ago. It refers to a form of 'family spastic paraplegia,' of which the symptoms are increased reflexes and ankle clonus, occasionally associated with optic atrophy. This is practically indistinguishable from disseminated sclerosis in the early stages, but the condition went steadily to the bad in every case—that is, there were no remissions, as in the latter, and there was no sensory disturbance or affection of the sphincters.

Fourthly, Friedreich's ataxia. The points of resemblance, of course, between this and disseminated sclerosis are the nystagmus and inco-ordination ; but in the former the knee-jerks are nearly always lost (I have seen two cases in which they were retained), there is no optic atrophy, the volition tremor and staccato speech so characteristic of the latter are absent, and the bodily deformities common in hereditary ataxia are not found in disseminated sclerosis. The movements are oscillatory rather than jerky, and the speech thick rather than scanning.

Fifthly, syringomyelia resembles disseminated sclerosis in the presence of nystagmus, but the loss of sense to heat and pain, while that of common sensation is preserved, at once sets this affection apart.

One must never forget the possibility that there may be two coexistent diseases of the nervous system, which to greater or less extent mask one another. Speaking of syringomyelia recalls the following case to my mind in this connection. I saw it in the Out-patient Department of the Queen's Square Hospital. The patient, a woman, came up complaining of attacks of acute paroxysmal abdominal pain, of difficulty of standing in the dark, and stated that at times she pitched forward when washing her face. There was some nystagmus, and weakness of both arms—the right markedly so, the left only slightly. There were three nasty ulcers on the fingers of the right hand, the results of burns while cooking. It is not necessary to go in greater detail into the symptoms, for they do not concern the present discussion; but on minute examination it was found that she had frequently from childhood burned or scalded the fingers of her right hand without noticing anything until blisters or sores arose—in fact, she had syringomyelia. Some years—I think five—before coming up to hospital, she had married, and had contracted syphilis from her husband; and, implanted upon her congenital nervous affection, the girl had developed locomotor ataxy, and the combination of the symptoms of these two diseases was of great interest.

It is usually considered necessary, when speaking of disseminated sclerosis, to enter into the diagnosis between it and paralysis agitans. I fail to see the reason for this. The tremor is not jerky, is not volitional—in fact, it can be temporarily stayed by effort—the affection occurs at a later age, the facies is distinct, the speech is not staccato, the spread is usually hemiplegic before passing to the other side, in 75 per cent. (according to statistics) the upper extremity is first affected, and, finally, the knee-jerks are usually normal.

From general paralysis of the insane the diagnosis is usually easy, for the speech in this disease is tremulous and mumbling. Volition tremor may be present, but is more likely to affect the facial muscles, and is more fibrillary in character. The sense of well-being found in many patients with disseminated sclerosis does not reach the ideas of grandeur of the general paralytic.

The symptoms of brain tumour sometimes resemble those of disseminated sclerosis. Thus, a cerebellar tumour may give rise to inco-ordination and nystagmus, a pontine one to inco-ordination brought out only when voluntary movements are attempted. Apoplectiform and hemiplegic attacks may occur, as already stated, in disseminated sclerosis, but in the latter headache is rarely, if ever, so acute, vomiting does not occur, and, finally, there is neither optic neuritis nor signs indicative of pressure. I have had under my care for the past five months a patient in whom the diagnosis between disseminated sclerosis and cerebral tumour was by no means clear, but optic neuritis is now becoming evident, so that, from a personal point of view, I am glad to be able to say that my provisional diagnosis of some six or eight weeks ago is gaining confirmation. Headache, which had been absent during the first three months of my attendance, has been often very intense since that time.

The question of diagnosis from hereditary cerebellar ataxia may be a very difficult one. The main points of similarity are paralysis or paresis of one or more eye muscles, the non-reaction of the pupil to light, nystagmus, and the presence of optic atrophy. There may be volition tremor, and the age of onset may be about the same—namely, twenty to thirty years. The chief points of difference are few. The spastic element of disseminated sclerosis is not present in cerebellar heredo-ataxy, the tremors do not cease when the patient is at rest, the facial muscles are often affected, and the speech differs from the staccato of disseminated sclerosis. The words are kept in, as it were, and then ejected spasmodically.

Finally, there is an affection which closely resembles disseminated sclerosis in nearly every particular, and I think is invariably diagnosed as that disease. I have never met with a case, to my knowledge ; and as I believe the number of recorded cases only amounts to half a dozen or so, it is unlikely that many in general practice will come across them. In the reports of five cases which I have read, the only differences that I can see between these and the disease which is the subject of this paper (I speak from the clinical point of view) are that the nystagmus is not marked, the speech is nasal with a certain amount of scanning (it is described as different from the staccato of insular sclerosis, but in what the difference consists I cannot gather), the sphincters are not affected, and Westphal's paradoxical contraction is a notable feature ; also the psychical symptoms are more in evidence than is the rule in disseminated sclerosis.

This affection goes by the name of Westphal's pseudosclerosis. Post-mortem, nothing, so far as I am aware, has yet been discovered with certainty to account for these symptoms. In the cases first described nothing pathological was found at all ; in the later ones examination results were probably more exact, owing to improved methods of investigation, and these are reported to have shown a tough, leathery consistence of the cerebral tissue, with degeneration of the crossed pyramidal tracts. It begins in late childhood, and is probably on a par with the diffuse sclerosis of the brain which is sometimes found in patients who are the subjects of congenital syphilis.

V

THE DIFFERENTIAL DIAGNOSIS BETWEEN CEREBRAL HÆMORRHAGE, EMBOLISM, AND THROMBOSIS

THE question of the differential diagnosis between cerebral hæmorrhage, embolism, and thrombosis may be at times comparatively easy of solution, as when a man in good health becomes rapidly unconscious, and paralysis of one side of the body follows, without there being any sign of cardiac valvular mischief. But in other cases it may present many points of difficulty, rendering a diagnosis almost impossible, and the utmost one can do is to merely give an opinion based upon a balance of probabilities—an opinion liable, even after all due care has been taken, to be overthrown by evidence on the post-mortem table.

For the purpose of constituting a basis on which to found the remarks which I wish to place before you to-day, it will be well to describe shortly as typical an example as I have met with of each of these three conditions.

Firstly, cerebral hæmorrhage. In May, 1900, I was called to see a man who was said to have 'fallen down in a fit.' The history given on my way to the patient by a friend of his who had come to fetch me was that he had been complaining of sleeplessness during the previous week or two, and latterly of a dull headache and slight dizziness at times. He had just returned by train from his place of business, and was walking up a slight incline from the railway-station, when he had suddenly complained of a severe pain in the head, and immediately fell on the roadway. As far as the friend could tell, there had been no convulsion or twitching. He had missed his usual train, and it was thought that, coming on by a later one, he might possibly have been walking a little quicker than usual to reach his home. His age was fifty-six.

I found the patient, a stoutly built man of a little less than the average height, lying on a sofa at an inn not far from the station. His face was congested and bathed in perspiration; the right arm hung limply down by the side of the couch, the right foot was everted and the leg flaccid. He was breathing stertorously, both cheeks being blown out with each expiration, but the right more so than the left; the lips were frothy. The pupils were moderately dilated, equal, so far as I could see, but insensitive, and the eyes turned towards the left side. The pulse was 70 per minute, full, and of a fairly high tension. He had passed urine, and the bowels had also acted while he was unconscious. The right arm and leg fell limp and flaccid on being released, the left more slowly. I attended this patient until he died seven days later. At the end of twenty-four hours the temperature rose to 101°, and the right leg and arm were resistant to flexion—in fact, the so-called 'early rigidity' was present, and the eyes were no longer turned towards the left. He partially recovered consciousness on the fifth day after the fit, but was unable to speak. He continued to pass all his motions under him in bed. He became unconscious again during the following day, the coma gradually deepened, and the patient died just a week after the stroke. This is, I think, one of the most typical cases of apoplexy I have personally met with.

Passing on to the second condition—namely, cerebral embolism. In November, 1904, in Maritzburg, Natal, I was sent for to see a soldier's wife whom I had visited some three or four months previously, when I had found a presystolic mitral murmur, a sequela of two former attacks of acute rheumatic fever, the first having occurred at the age of eight, and the second when the patient was seventeen years old. She was now twenty-one. I was told that, while sitting quietly doing her needlework in her quarters, she had suddenly fallen on the floor unconscious. Her friends had not sent up till some time had elapsed (about an hour, so far as I could gather), because it was thought that she had merely fainted. On my arrival, she was lying on a bed. She was not deeply unconscious, but when called loudly seemed to rouse—partially, at least. The pupils were equal, directed forwards, and the conjunctivæ were sensitive. The left arm and leg were paralysed, but the leg was not as flaccid as the arm. The pulse was 90 per minute, of somewhat low tension. In the course of a few hours consciousness began to return, and she was able to swallow, but with some difficulty apparently. In a couple of days she was able to speak, and as far as she could explain had had no warning of the attack. The leg was a little weak, but the arm remained paralysed. The knee-jerk was exaggerated on the left side as compared with the right. During the next fortnight the arm gradually improved, and the leg seemed to regain its former power. The knee-jerks were equal at the end of a month, and the patient could walk without a limp ; but when she left for England about three months after the attack the finer hand movements had not returned, and she was unable, for example, to untie a knot with the fingers of that hand, and the power was less than normal in all its movements.

I have notes of only two cases of cerebral thrombosis, excluding those in which the condition supervened on marasmic states in children. Of these two, the following is, I think, the more typical :

A girl, twenty years of age, came to me complaining of shortness of breath and palpitation. The former was greatly aggravated on attempting any exertion, such as going upstairs or walking uphill. She was very pale, but not at all ill-nourished. The conjunctivæ and mucous membranes of the lips and mouth were markedly anæmic, a hæmic murmur was audible over the pulmonary area, a venous bruit very loud at the root of the neck, and the ankles were puffy. I saw her first in the evening, after her day's work. According to her history, she had had a very similar affection two years previously, when she had suffered a good deal of pain in the inner part of the right thigh, with swelling of the right leg. She had been in hospital for treatment then, and said that the doctors had called it 'thrombosis from anæmia.' Three days later I was sent for to see this patient. She stated that she had had a severe headache for the last twenty-four hours, and that her right foot and leg felt numb, and there was a tingling sensation in the limb. She was drowsy, but not at all comatose, and the speech was slow. I put this down more to the drowsiness, and not to any definite speech-centre affection. She complained also that things in the room were going round, and she felt sick with the giddiness, but did not actually vomit. There were no convulsions either then or at any time during the attack ; the temperature was 99·6°, pulse 108. Later, the right leg became more and more paretic—in fact, it could not be moved voluntarily—and on the following day the right arm was distinctly weaker than the left. During the course of the next week considerable improvement took place ; the temperature, which never rose higher than 100°, gradually fell, and the pulse became reduced in rate ; the tension was low. By the end of three weeks power had returned in the leg ; the arm had greatly improved, but finer hand movements were badly performed, and even two or three months later she could sew only with a certain amount of difficulty, which, however, she stated was getting less as time went on.

The descriptions just given are, I fear, somewhat meagre. It will be naturally remarked that in them too much stress has been laid on anæmia and wasting diseases as causes of thrombosis, whereas such are comparatively rare, and not enough on syphilitic endarteritis as an ætiological factor ; but I have merely taken examples from my own case-books which show better the prodromata and actual condition of patients suffering from the maladies under discussion. Thus, thrombosis is a frequent cause of hemiplegia in early and middle life, and is then in most cases due to syphilis (in late life, of course, to atheroma), and syphilitic thrombosis may result in hemiplegia of sudden onset ; but amongst my cases I had fuller notes on those described, and consequently selected them. At all events, they will suffice for giving us some ground to go on in discussing points of similarity and difference between these three conditions, and enable us to construct some method for establishing the differential diagnosis of cerebral hæmorrhage, embolism, and thrombosis.

1. **Age.**—Excluding cerebral hæmorrhage the result of injury, one of the commonest conditions is a change in the arterial sheaths spreading to the muscular coat, leading to weakening of the vessel wall, and production of an aneurism, from rupture of which the hæmorrhage takes place. Such a weakening and dilatation being present, a very slight exciting cause producing a rise of blood-pressure, such as coughing, defæcation, or physical exertion, may bring on the rupture, but often even this may not be discoverable. We must look, therefore, for a more remote cause which has led to the weakening of the vessel wall, and such may be found in

alcohol, syphilis, gout, lead, etc. Those who habitually indulge in more alcohol than is good for them (not necessarily the man who is frequently intoxicated) pay for their pleasure with a fatty heart and a condition of arterio-sclerosis. Syphilis, lead, gout, and such-like toxæmic conditions, similarly lead to degradation of tissue, the parts showing greatest affection being not infrequently the vascular system, and the cerebral vessels in particular. Coexistent with the arterio-capillary fibrosis is found some degree of cardiac hypertrophy (the discussion as to which of these is cause and which is effect does not come within the scope of this paper).

Now, since these causes are at the basis of a large number of cases of cerebral hæmorrhage, we would expect to find that the majority occur at an age when they have had time to make their influence felt, and statistics show that nearly twice as many occur in subjects of from forty to fifty years of age as are found in any other decade ; and since general deterioration of tissue is largely shared by the vascular system as age advances, we find that 75 per cent. of cases of cerebral hæmorrhage occur over the age of forty years.

Cases do occasionally occur in children, but these are rare. I do not, as has already been stated, take account in this paper of traumatic hæmorrhage. Just as in one family a tubercular diathesis may be handed down from parents to children (I know of a case in which four children of well-to-do parents, living a healthy life, died of phthisis between the ages of twenty-three and twenty-eight, in spite of every care, residence abroad, and so forth), so in another family the vascular system may tend to early degeneration ; and when we consider how often among the poor parents give their children alcohol in some form or other, and how many cases of congenital syphilis are found, we cannot feel much surprise at arterial degeneration taking place even in the years of childhood. In illustration of the former, I was told by a mother only a week ago that the only thing which she found would procure her baby, an infant of ten months, a good sleep, and consequently would allow herself to pass an undisturbed night, was ‘ a few drops of beer,’ which she gave to the child as a regular thing in the evening, and occasionally in the day-time also, if she had any work to do at which she did not want to be disturbed.

Embolism, resulting as it so often does, and as the report of the case already mentioned bears out, from pre-existing endocarditis, occurs at an earlier age in the majority of cases. Thus, there has usually been time for one, and possibly more than one, attack of acute rheumatic fever, and for the subsequent development of valvular disease. This condition is, therefore, more likely to take place in later youth, and, indeed, is much more common under the age of twenty-five, or at any rate thirty, years than it is after that time.

Thrombosis of the cerebral vessels may arise, just as thrombosis elsewhere, owing to some condition of the blood, or to some morbid affection of the vessels. Thus, as in the case detailed above, chlorosis is a cause, but exhausting diseases which produce general deterioration of strength show their effects to a great extent in the circulatory system, so exhausting diarrhœa and marasmic states in children may result in cerebral thrombosis, or, again, typhoid fever in the third or fourth weeks may be similarly complicated. I saw two such cases at Johannesburg in 1901 and 1902. One recovered, and one terminated fatally. Of disease of the vessel walls, the most frequent are syphilis and atheroma ; or atheroma and weakened circulation may occur together, as when thrombosis takes place with the retarded circulation through atheromatous arteries in old age.

Regarding, then, the age of the patient, our first indication for differential diagnosis, we may say roughly that, unless there is some definite reason, such as exhaustive disease, typhoid, marasmus, profound anæmia, etc., to warrant the decision of thrombosis, symptoms are more probably due to hæmorrhage or embolism. Of these two, the former is more frequent after the age of thirty-five or forty, while the latter is much less frequently found above than it is below middle age.

2. **Sex.**—Men are more prone to cerebral hæmorrhage than are women. This is due to several causes combined—namely, their more arduous labour, and the consequent greater strain on the heart and vascular system ; their working in greater numbers in occupations in which lead is employed—for example, painters, coach-builders, etc.—the frequency with which gout occurs in men ; and, finally, the more frequent and constant use of alcohol.

Embolism.—Seeing that mitral stenosis is much more frequently found in females than in males, this condition of embolism occurs more often in the former, for of all valvular lesions in which embolism is seen, stenosis of the mitral orifice is the most frequent.

Thrombosis may occur in either, but in the young, where marasmus and weakening diseases are about equally distributed, sex has no influence. As years go on, thrombosis occurs with greater frequency in women (according to statistics), but I do not know any adequate explanation of this, seeing that, though women suffer more than men from anæmia, thrombosis from anæmia and such-like causes is a rare event. Later still, in old age, the number of cases among men appears to predominate slightly, owing to the greater prevalence in them of atheroma.

These points fit in with the descriptions of the cases given above. The patient with cerebral hæmorrhage was a man of fifty-six, a short, thick-set man, who had been working late, and was hurrying more than usual, owing to his having missed his train ; the one with embolism was a woman under middle age, with a pre-existing mitral affection ; and, lastly, the one with thrombosis was a girl suffering from profound anæmia.

3. The third point which is of aid in the differential diagnosis is the **previous history**. This has already been dealt with incidentally in the foregoing remarks, but a short résumé of it will not be out of place.

A history of prolonged hard work, such as that of a blacksmith or other occupation where hammering is needed, or heavy lifting, such as the work of a porter, warehouseman, etc., or a history of working with lead, or of indulgence in alcohol, or habitual excess of food ; a knowledge that the patient was a sufferer from gout or chronic nephritis—all would favour the idea of hæmorrhage.

A history of rheumatic fever in the past, or of chorea, or the actual presence of a mitral murmur, or of endocarditis at the aortic valve, would suggest that we might have to deal with a case of embolism.

A history of syphilis by itself might favour either hæmorrhage or thrombosis, but more probably the latter, for syphilis to so large an extent results in the production of fibrosis in the arteries of the brain that it is a commoner cause of thrombosis than of hæmorrhage, the vessel wall being too much thickened to give way. If the patient were in a very debilitated condition from the disease or from other affection, such as anæmia or any wasting illness, this would be in favour of thrombosis. An inquiry into the prodromata and the mode of onset, which will next be spoken of, would be of considerable assistance.

4. **Premonitory Symptoms.**—It is the exception to find a history of premonitory symptoms in cerebral hæmorrhage. Occasionally, however, such are present, though they are rarely appreciated by either the patient or the medical attendant in their serious significance. There may be merely headache, or a feeling of fullness and congestion in the head, increased on very slight exertion, or there may be a sensation of tingling or numbness in arm or leg, or occasionally twitchings of face or arm muscles, the so-called Raymond's prehemiplegic hemichorea. In other cases there may be dizziness, or possibly a passing affection of speech, such as inability to remember the word the patient wishes to use, and he is quite conscious of the difficulty, or there is a transient disturbance of vision. These may be associated with a feeling as if about to faint, or a sense of weight in one limb, and so on; but, since none of them are characteristic, they are rarely interpreted aright at the time, though remembered afterwards with the regret of a warning disregarded.

In embolism it is very exceptional to have any prodromal symptoms whatever—in fact, the presence of such militates considerably against the diagnosis of embolism. If premonitory signs and symptoms are marked before the onset of a so-called 'apoplectic attack,' this is strong evidence that the condition is thrombotic. The forms they take are those already enumerated above—namely, vertigo, headache, transient aphasia or amnesia, tingling, numbness, etc., but, I think, not twitching of muscles—and they may persist for a considerable period before the onset of the true attack.

5. **Mode of Onset.**—If the onset is sudden and occurs during some physical effort, the probabilities are that we have to deal with hæmorrhage. The loss of consciousness may also be sudden, as in the case narrated above, or more gradually, according as the height of blood-pressure is great or small—that is, according as the bleeding is rapid or slow. If the former, a true apoplexy occurs; if the latter, there is a rapid review, so to speak, of the prodromal symptoms, fullness in the head, perhaps amounting to severe headache, giddiness, speech

affection, and general bewilderment, the so-called delayed apoplexy ; if very slow, convulsions may be present at the onset. There is in most cases a certain amount of elevation of temperature, possibly passing on to hyperpyrexia, when the issue will probably be fatal ; but a true secondary rise is indicative rather of softening, the result of embolism or thrombosis, than of hæmorrhage.

The effect of the hæmorrhage depends more upon the blood-pressure than upon the size of the lumen of the vessel which has ruptured, though, of course, these are to a large extent correlated. By Wernicke's law, 'the traumatic effect of the hæmorrhage is equal to the product of the mass of effused blood into the square of the rapidity with which it is poured out' (Hirt), and this, of course, is directly dependent upon the intravascular blood-pressure.

In embolism consciousness is usually, but not always, lost, particularly if only a small branch is involved. At any rate, the paralysis is sudden and usually worse at first, and within a short time partially at least clears up. The temperature does not rise unless, of course, the embolus is septic. It has been stated that if the loss of consciousness is complete, this fact argues against the presence of embolism and in favour of hæmorrhage. Other points of difference are that there are not, as a rule, the same respiratory symptoms, nor, from the nature of the mischief, will the features be so cyanosed or congested as in hæmorrhage, and not uncommonly definite epileptiform attacks may be in evidence. All this, however, though theoretically of aid in diagnosis, is not in practice of great value, since the onset of the two conditions may exactly simulate one another.

Pathologically, according to Wernicke, when embolism takes place, the vessels on the peripheral side of the embolus collapse, and by their contraction force the blood contained in the capillaries on into the veins, and since a vacuum results, a negative blood-pressure is produced—that is, while hæmorrhage is the outcome of a rise of blood-pressure, the results of embolism are due to a negative pressure, and according to the amount of this negative pressure, so there is more or less destruction of the brain tissue.

If thrombosis is found after an apoplectic seizure without hæmorrhage, it is probable that embolism preceded the other process ; for thrombosis alone occurs so slowly that little, if any, loss of consciousness is noticed at the onset. Though this holds true in the majority of cases, it is not so in all. Thus, as already stated, syphilitic thrombosis often causes a sudden onset of symptoms, such as a sudden hemiplegia, for example. The differences between the actual conditions of the patients in these affections has been sufficiently exemplified in the reports of the cases given at the beginning of this paper and in the foregoing paragraphs.

During the early acute stage in hæmorrhage the reflexes are absent, and remain so to the end should the coma deepen and the case rapidly terminate fatally ; but if consciousness is regained, the deep reflexes return after a longer interval on the paralysed side, though later the knee-jerk on that side is greater than on the non-paralysed. Superficial reflexes usually remain diminished, and Babinski's sign of extensor response is present. As regards sensation, this may vary in hæmorrhage from merely a little numbness to total hemi-anæsthesia ; in others there may be diminished sensibility to tactile impression, without analgesia. Should the anæsthesia be marked, there is greater probability of the condition being due to thrombosis than to hæmorrhage.

6. Next, the questions of the **hemiplegia and later condition** are of importance. In hæmorrhage, as a rule, the hemiplegia is complete, involving the face, upper and lower limbs of the opposite side of the body (except in the 'crossed paralysis' of pontine hæmorrhage), the tongue deviates to the paralysed side, owing to the pushing action of the unopposed genio-hyo-glossus of the sound side. As time progresses, recovery is often only partial, the leg being dragged or swung round in walking ; late rigidity with contracture in the arm occurs, and posthemiplegic chorea and athetosis may be evident. There is not uncommonly considerable psychical alteration in the patient. He may be weaker mentally, incapable of readily grasping facts or of concentrating his attention for any length of time. Amnesia is sometimes a troublesome symptom, and the patient may in rare instances become demented after a more or less prolonged period of delusions and hallucinations.

The rate of improvement in hæmorrhage is slow. After a typical attack there is no motion in the paralysed limbs for between two and three months, and speech is affected. During the ensuing three months there is some amelioration, and the patient may be able to move his toes and possibly the leg below the knee. By the end of a year he may be able to get about with the dragging, stilted, or circumduction walk with which we are all familiar. The arm improves to a less extent than the leg, and often there is no amelioration in the condition of the upper limb, but the state of things is made worse by the development of contractures.

In embolism there may be softening, but there is not so much destruction of tissue as in hæmorrhage, and the condition in many cases improves much more rapidly. Also, as already mentioned, the attacks often show fits of an epileptiform character at the onset. This early improvement, which may amount to actual disappearance of the paralysis, is an important sign of embolism as opposed to hæmorrhage.

In thrombosis a true apoplectic stroke is decidedly rare, unless it has supervened upon embolism. The softening resulting from either embolism or thrombosis may give rise to focal symptoms, such as a monoplegia; or if anastomosis be fairly free, there may be complete recovery after quite a short interval.

When we consider the pathology of these conditions we can see that after thrombosis, for example, recovery may be complete if the condition has not been present sufficiently long to lead to softening; and also, for the same reason, late rigidity is rarely found in thrombosis, while it is common in hæmorrhage. Should a hemianæsthesia originally present persist, the probabilities are that we have to do with a case of hæmorrhage. In thrombosis as a sequel to syphilitic disease of the vessels, according to the vessel involved, one may find various cranial nerves affected in an apparently anomalous way. The condition may be quite transient, from the partial occlusion causing a temporary deprivation of blood-supply, with resultant aphasia, for example, recovery taking place in a few hours. At other times there may be a similarly transient hemiplegia, but rarely complete—more usually there is merely paræsthesia ; but if the occlusion be marked, softening may ensue, and the condition does not then clear up rapidly nor to the same extent.

7. **The Coma.**—In cerebral hæmorrhage, if the bleeding be very slight, this symptom may not be present, but this is extremely unlikely. I have never seen such a case myself. Occasionally, the coma may be very deep from the first, the

patient being suddenly struck down and incapable of being roused; but in the majority of cases the condition of ingravescent apoplexy is seen, the patient being merely drowsy at the onset, and this somnolence and drowsiness passing gradually to deep coma. In embolism there is usually a certain amount of coma, but rarely very deep—in fact, this symptom, if profound, is rather in favour of hæmorrhage or thrombosis than of embolism. If the basilar artery be thrombosed, the coma is very deep.

8. Lastly, a few words ought to be said as to signs other than cerebral which may help us in deciding the point in question. Thus, the presence of chronic interstitial nephritis, with consequent arterio-capillary fibrosis and hypertrophied heart, is in favour of hæmorrhage. Even a high-tension pulse alone is suggestive, whereas if the vessels are atheromatous, the condition present may be either hæmorrhage or thrombosis, and this would probably be corroborated by attention to the points already dealt with as regards mode of onset, the hemiplegia, the age of the patient, etc. Attention should also be paid to the condition of the heart. With arterial sclerosis, Bright's disease, gout, lead-poisoning, etc., this organ will be hypertrophied, and a hypertrophied heart is in favour of hæmorrhage. If murmurs are audible, especially a mitral presystolic murmur, attention would be more particularly directed to embolism.

We must not overlook the fact that, although signs of embolism may be present in other parts of the body, the cerebral condition may be only due indirectly to embolus. Thus, *e.g.*, the malignant form of endocarditis may, in the first instance, have led to cerebral embolism, and later, owing to this embolus being septic, arteritis may have been set up, and the vessel may rupture, so that on examination post-mortem a cerebral hæmorrhage may be the condition revealed. This is, of course, rare, but it is a possibility.

If the symptoms are due to thrombosis, the heart's action is certain to be weak, thus distinguishing it from the full, bounding pulse of hæmorrhage, on the one hand, and the normal pulse usually found in embolism on the other. Also, any murmurs present in thrombosis will probably be hæmic in origin.

Rapidly reviewing our subject, then, one may say that if valvular lesion be present, we should suspect embolism. If there be hypertrophy, with albuminuria, the discs should, if possible, be examined for the characteristic flame-shaped hæmorrhages, and, if found, these signs argue greatly in favour of cerebral hæmorrhage, though again a reservation must be made, for with these signs present the condition might be uræmic in origin. If atheroma be present, either hæmorrhage, embolism, or thrombosis may be the result, but the first and last of these are both more probable than the second.

A transient loss of consciousness is more likely to be due to embolism than to hæmorrhage, to thrombosis, or to temporary anæmia of the brain from syphilitic endarteritis, while deep and prolonged coma favours hæmorrhage. If the patient be below middle age, we must think strongly of embolism, and examine for endocarditis and valvular mischief, unless we have a previous history of anæmia or some debilitating disease, in which case the condition may equally well be thrombotic ; if old, the probability is that we have to deal with hæmorrhage or thrombosis, more likely the former—unless again we have a history of some severe wasting affection preceding the attack—and the heart's action may be very feeble.

Prodromata are occasionally noticed in hæmorrhage, but not in the majority ; in embolism rarely, if ever ; in thrombosis they are frequent. At the onset in hæmorrhage convulsions may be absent, but if seen they are usually general, whereas in thrombosis they are more localized. In hæmorrhage there is often considerable early rise of temperature ; in thrombosis this is but slight ; in embolism, unless the embolus is infective, it is absent. Again, after the onset the paralysis spreads quickly in hæmorrhage—in fact, there may be practically immediate hemiplegia. In embolism, if the vessel blocked be a large one, the paralysis affects the whole of the opposite side of the body at once ; but, as a rule, a smaller branch is involved, epileptiform convulsions are commoner, and the paralysis is rarely so widespread within such a short time. In thrombosis the spread is slower, as stated above, and is not accompanied by general convulsions, but by focal, if such are present at all.

VI

ACUTE ENDOCARDITIS, WITH UNUSUAL CEREBRAL SYMPTOMS

Case read before the meeting of the Shropshire and Mid-Wales Branch of the British Medical Association, November 20, 1906.

THE case about to be related is of considerable interest from the point of view of diagnosis. Cases such as this are, fortunately, met with but rarely in private practice, and, although offering a wide field for discussion, I regret to say that the results must remain in some degree inconclusive, owing to the absence of a post-mortem examination, permission for such being very difficult to obtain in private practice, as all are aware, and the refusal of which constitutes one of the greatest barriers to progress for the general practitioner.

On March 4, 1906, I was called in in consultation to see a patient, a girl of thirteen years of age, of whose case the following account was given :

Family History.—This was irreproachable ; mother and father are both alive and well. The patient is one of five children, all of whom are strong and well, and have had no illness, except the minor ailments of childhood. The patient is the second child. One maternal aunt died of ‘ something the matter with the lungs ’ at the age of fifty-eight ; no history of tubercle or syphilis.

Previous History.—The present medical attendant informed me that the patient was affected with congenital heart disease ; that she had had a marked systolic murmur over the aortic and pulmonary areas for years—at least for five or six—as long as he had known the family. There is an indefinite history of a ‘ breakdown ’ occurring some two years ago with an ‘ attack of fainting.’

History of Present Illness.—Five weeks ago patient was somewhat suddenly taken ill with an attack of fainting after cycling. She had been accustomed to ride her bicycle to school daily, a distance of three miles, with a steep hill to climb at the end of the journey. Apart from this, the patient took practically no exercise, but read a good deal, studied hard, and was considered to be a clever and exceptionally bright girl.

Condition on Examination.—Patient lies in bed, with two pillows and a bolster supporting her head, thus almost recumbent. The eyes are bright, lips and cheeks cyanosed, but not deeply. Pulse, while the patient lies quietly in bed, is 134 per minute, with a tendency to irregularity. Respirations 25 per minute, of moderate depth, and there is no distress. The nails are of a pinkish colour, with slight tinge of blue; there is no clubbing of fingers. Definite capillary pulsation is noticed on gentle pressure of the nails, and of the mucous membrane of the lips under a glass slide.

Heart.—There is diffuse visible pulsation, and this can be felt as far out as 1½ inches outside the left nipple line in the sixth (and possibly seventh) intercostal space. A presystolic thrill is felt over the mitral area. Percussion dullness begins above at third intercostal space, and extends two finger-breadths to the right of the sternum. On auscultation, to-and-fro murmurs are heard over both aortic and mitral areas, and a rough systolic over tricuspid. A systolic murmur can be heard behind at the angle of the scapula.

Lungs.—Nothing abnormal detected, except a few small basal crepitations.

Liver.—Dullness begins at the fifth interspace in the right nipple line, and extends from one to two finger-breadths below the right costal margin, where faint pulsation can be felt. The spleen is enlarged, but not greatly. There is little, if any, free fluid in the abdominal cavity. There is puffiness of ankles and very slight œdema of legs.

Urine is small in amount (specific gravity 1024), dark coloured, with a faint trace of albumin.

The **diagnosis** made at the time was acute dilatation from the exertion of riding the cycle uphill, her heart being already handicapped by its congenital malformation, whatever that might be, and there was failure of compensation, but not very advanced.

The **treatment** recommended was absolute rest in bed, food fluid, or at least easily digestible, to include jellies, etc. (the parent is a farmer in good circumstances, and greatly inclined to overfeed his children). A mixture was prescribed containing 5 minims of tincture of digitalis, which dose was to be increased if the pulse remained rapid and the urine did not materially increase in amount.

I did not again see the patient till, at the wish of their regular medical attendant, I took over charge of the case on March 15.

March 15.—Heart dullness has diminished in area, does not extend beyond the right sternal edge. Beating of the heart only 66, and irregular ; murmurs as when first heard, but the aortic systolic is a little harsher and the aortic regurgitant less marked. The patient is suffering greatly from headache and vomiting, the headache being mainly frontal. Ophthalmoscopic examination not possible, as patient was intolerant of any light. Urine contained bile. The patient was constipated, so an enema was given, which resulted in a light-coloured stool. There was no apparent jaundice.

The headache and vomiting, with intolerance of light and slow pulse-rate, were suggestive of cerebral mischief, but I was informed that the tincture of digitalis had been pushed to 12 minims three times daily. The urine was more abundant, and the pulse slow and irregular, so it was thought that the former symptoms, at any rate, were possibly, if not probably, due to overdosing with digitalis. All medicine was therefore stopped, except some hepatic tabloids to be given twice daily. These contained calomel 1 grain, podophyllum $\frac{1}{12}$ grain, etc.

March 16.—Pulse only 60, very irregular. Vomiting still very severe, the attack having no relation to the times of taking food. Headache is intense at times of vomiting. Bowels not yet open.

March 17.—Pulse 58 ; vomiting still troublesome Tinct. Iodi 3 minims in water prescribed to be given every three hours, and a mustard-leaf applied to the epigastrium.

March 18.—Pulse remains only 58 per minute ; vomiting is less, but still by no means ceased. Headache very severe, and the room has to be kept quite dark, as the patient is intolerant of even faint light.

Phenacetin 5 grains, caffeine citrate 1 grain, was given, and repeated in half an hour. The headache was greatly relieved.

March 20.—Pulse to-day 68, more regular. Vomiting has entirely stopped, but headache very intense, and not so easily relieved. For fear of the repeated doses of phenacetin on a weak heart, the following was prescribed instead :

℞	Ammon. brom.	gr. x.
	Spir. ammon. aromat.	♏x.
	Aq.	ad ℥ii.

To be given occasionally for the headache.

This gave much happier results, the headache disappearing in a few minutes. I made the following note on the physical condition on this day : ' No heart dullness to right of sternum ; apex-beat in nipple line, sixth space ; no aortic regurgitant murmur audible ; œdema of legs quite disappeared ; liver-edge not felt pulsating and margin retracting.'

At 3 p.m. the same day I was telegraphed for, and on arrival found the patient weak and very prostrated. A history of a syncopal attack was given, occurring about 1 p.m. Stimulants had been given, and the patient rallied.

March 22.—I had the following note : ' Patient is much better, is taking milk well, and can bear the daylight, although she will not submit to ophthalmoscopic examination. The temperature up to 20th inst. had ranged from normal to 100°, occasionally reaching 101°. Last evening it was 102°, this morning 100·4°, this evening 102·4°. Headache only slight, considered to be due to the temperature, as it is of a throbbing character, though not severe. Patient is a little talkative, but bright and cheerful. There is slight drooping of the right eyelid, but it can be raised by voluntary effort.'

March 23.—I was again telegraphed for, and found on arrival that at 7 a.m. patient had suddenly complained of intense headache. The nurse had given her 1 drachm of the ammonium bromide mixture (5 grains) during the night for the headache, which was relieved by it. The acute exacerbation had come on at 7 a.m., and the patient slept shortly afterwards. As she could not be roused at 10 a.m., I was telegraphed for. On arrival at 11 a.m. I found patient unconscious, with shallow breathing, but at normal rate, the pupils equal and moderately dilated, corneæ insensitive to touch. Calomel (3 grains) was placed on the tongue. Cold applied to the head caused patient to make a movement with both hands to remove the application. The heart and physical signs were as before ; there was no flaccidity of limbs, nor any twitching, spasm, or convulsion.

March 24.—Patient in same state of coma ; the bowels have acted. On making an examination of the chest, the patient pushes away the stethoscope with her hands. The left leg is paralysed, and remains in whatever position it is placed ; she moves the right leg voluntarily when it is touched. The knee-jerk is not obtained in the left leg.

March 25.—Patient recovered consciousness this morning for half an hour, and took about 2 ounces of milk. She recognized her parents, and spoke to them, but after the half-hour sank again into her former condition, and on my arrival was breathing in a manner somewhat suggestive of the Cheyne-Stokes type, taking two deep breaths, and then pausing for some eight or ten seconds. This, the nurse informed me, had gone on during the night, and until she recovered consciousness. To-day both legs are paralysed, but warm ; no knee-jerk elicited in either. There is no œdema.

March 26.—Patient again recovered consciousness this morning about 9 a.m., and has remained conscious since that time. She speaks in a whisper, and, as a rule, replies rationally to questions, but at times rambles off in delirium. She does not appear to recognize anyone by sight, only by voice when one speaks to her. The eyes are very congested, and look dull ; the pupils are equal. Pulse 80, regular, and of moderate tension.

March 27.—Patient this morning is acutely maniacal, with rambling and incoherent delirium, and tossing her arms about in bed. During the night she had picked constantly at her nose and lips, and made them bleed profusely ; the hands had, therefore, been wrapped in flannel. The conjunctivæ are very congested, and she does not recognize even her parents when they speak to her. Ophthalmoscopic examination very difficult, owing to the frequent moving of the head. The right pupil, however, does not appear to react when light is thrown into the eye ; the left reacts, but not well. The discs seem, from a fleeting view, to be congested and hazy.

March 28.—Patient quiet to-day, but very prostrated.

Recognizes her parents and myself by voice, and seems to see when the object is in the direct line of vision, and slightly to the right; but the field is much narrowed, and perception very poor. The legs are still quite paralysed; no knee-jerks present, but legs not anæsthetic. She seems to feel pain when they are touched, but touch anywhere appears to cause pain.

March 29.—Patient is taking milk much better, has had no more comatose or maniacal attack. Sight and legs remain as before. Heart action is rapid (130), systolic mitral and aortic murmurs audible; no presystolic apical murmur is heard, but a thrill is felt.

March 31.—Complained yesterday of pain in lower part of abdomen. To-day there is a large median swelling the size of a small melon above the pubes; the skin over it is tense, red, and œdematous. She has passed water freely; this made no difference to the size or shape of the swelling. The eyes are sunken; the power in the arms is fair. Patient often attempts to speak, but wanders from one subject to another, and rarely replies directly to questions. She has taken 1½ pints of milk during the night. There is apparently some paresis of muscles of the larynx; occasionally a word is spoken audibly, but nearly always in a whisper, and the patient does not cough when she wishes to clear the throat, but gives a vigorous expiration; also, fluid is often swallowed with difficulty, and at times half chokes the patient. The lips are not affected; the tongue is protruded in the middle line. The pulse is increasing in rate, and is now about 140.

April 1.—Patient died at 5.45 a.m. this morning.

The main questions at issue in this case are: Firstly, what was the origin of the illness? Secondly, what was the nature of the cerebral lesion?—whether the endocarditis was a malignant development on the congenital malformation, with emboli setting up septic meningitis, or whether the cardiac condition was a thing apart, and the latter symptoms were due to a cerebral tumour, either rapidly growing or from hæmorrhage taking place into it. If so, the question arises: Where is the tumour situated? and if embolic, where could the embolus be to cause ptosis of right eyelid, and motor paralysis of both legs, and the contracted field of vision? Multiple thrombi, of course, occur from malignant endocarditis, but such a condition is comparatively rare. On the other hand, in spite of the history of 'congenital heart disease,' there is not much evidence of this, nor of malignant endocarditis, and the description agrees better with what one would expect in a case of meningitis, either septic or tubercular, and with this supposition the slow pulse, headache, constipation, vomiting, and hyperæsthesia would all be compatible.

AFTER-NOTE.

On further consideration of the features presented by this case, the following explanation of the symptoms may be suggested. I put them forward tentatively, for, though not entirely satisfactory, it nevertheless accounts fairly well for the state of things present. The features presented are strongly against the diagnosis of cerebral tumour, and more in favour of ordinary double mitral and aortic valvular disease, though I could ascertain nothing in the history to show what might have been the origin of this condition.

Paralysis of both lower limbs and of the third cranial nerve cannot, so far as I am aware, be caused by any single cerebral lesion.

Paralysis of both legs, without any affection of the arms, might be the result of the growth of a tumour at the upper part of the Rolandic area, involving both hemispheres, but the third nerve paralysis is thus left unexplained.

On the other hand, paralysis of the third cranial nerve makes one think immediately of the crus ; but here the lower limb fibres are situated to the outer side, the arm fibres in the middle, and the face fibres internally. A single lesion, therefore, could not account for paralysis of both lower limbs without implication also of the arms and face.

Both of these explanations are, therefore, placed out of court. The explanation which I put forward is that the ptosis was not of great significance, and might have arisen from softening, the result of a small embolus. I have omitted to mention that Babinski's sign was present, an extensor response being given. The probability is, therefore, that there was some transverse lesion of the cord. But even this is not necessary with a patient in such a desperate state as this girl was, for experimental evidence has shown that where the spinal cord is deprived of its blood-supply by interference with circulation in the abdominal aorta paraplegia results, and such may have been the case here, owing to the aortic regurgitation present. Thus, the symptoms are explicable as due to mere failing circulation associated with aortic regurgitation in a patient possibly the subject of a congenital heart lesion, with the subsequent development of malignant endocarditis. This would also account for the contraction in the field of vision which was found as mentioned above. From this point of view, there is no necessity for supposing that either cerebral tumour or septic meningitis was present.

On the other hand, the paraplegia was almost too persistent and marked to be explained by falling blood-pressure. Perhaps a spinal embolism had formed, while the median abdominal swelling may have been embolic, or, in spite of the history, tubercular, spreading from the tubes.

VII

THE IMPORTANCE OF A NAKED-EYE EXAMINATION OF THE FÆCES AS AN AID IN THE DIAGNOSIS OF DISEASE

An examination of a patient's evacuations may in some cases be of considerable aid to us in diagnosis ; but, in spite of this fact, which all will acknowledge to be true, we cannot help admitting that it is a point which is too frequently neglected by the medical attendant.

The subject of this paper was suggested to me by the fact that, comparatively recently I have been called in to see two patients, the main complaint being in each case 'diarrhœa.' The first was a weedy-looking individual of about twenty years of age, the second an emaciated man of sixty. On my requesting that a stool should be saved for my inspection, the former told me that this could not be done, as he always visited the water-closet ; that he did not see the use of it ; and that he had been under the treatment of two other doctors previously, but neither of them had expressed any wish to see what he passed. Owing to his malady, this man had been reaping a good harvest from two clubs or benefit societies of which he was a member. His manner somehow created in me an instinctive idea of distrust. His parents were decent people, and the history which they gave was that the patient was continually compelled to go to the water-closet about every half-hour or so during the day, and that on this account he was unable to work. He very rarely had to get up in the night. With some difficulty I persuaded the patient to make use of the night-stool for his next motion and to stay in bed for a couple of days. The following morning I saw the only motion passed since my previous visit ; it was a large, formed stool. Three days elapsed before he had another, and this was similar to the last. Obviously, there was no diarrhœa, and I could not believe that he passed frequent motions as large as those I had seen. To cut a long story short, I taxed him on the matter, and at length he confessed that his name was on the books of two clubs, each of which paid him ten shillings a week while he was unable to work, whereas at his employment he only made sixteen; thus he received four shillings more weekly when he did no work. He therefore turned malingerer, and visited the closet every half-hour in the day, and occasionally if he woke up at night. In this way he completely hoodwinked his parents, whereas in reality his bowels only acted once every two or three days, and he loafed about, drawing his twenty shillings a week from the club funds. He had been threatened with dismissal from his employment for incompetence, and he therefore conceived the idea of paying frequent visits to the closets at his work, and after a few days spread the report that he was suffering from 'consumption of the bowels,' and stayed away from work altogether, his employers in pity keeping his place open for him in hopes of his recovery.

The second patient stated that he had been treated by several doctors during the past twelve months (he gave me the names of four), and none of them, he told me, had expressed any wish to see what he passed. His actions were small, mixed with mucus, blood, and some purulent matter, and the passage of them caused pain. He had lost a lot of flesh. On making a rectal examination, a malignant growth was felt, too far advanced for operative measures, and the man died three months later. The neglect of the simple precaution of making a rectal examination and seeing the stools thus cost a man his life, or, at least, we may safely say that early recognition of his malady would probably have resulted in a considerable prolongation of life.

In the present paper it is my intention to deal with the subject of the examination of the stools in so far as it appeals to the general practitioner, and not to enter into more abstruse pathological discussions, such as the isolation of various organisms, nor into any intricate processes which require culture experiments and such-like for their determination.

I will, therefore, with this end in view, deal with the subject under the following heads:

1. The amount.
2. The colour.
3. The consistence and general characters.
4. The presence of abnormal constituents.

1. **The Amount.**—The normal amount of the daily evacuation in an adult is about 5 ounces. This is, of course, subject to considerable variation, depending on the quantity of food taken, the amount of absorption that goes on, and the frequency of evacuation. Thus, some persons may habitually pass two smaller motions daily; others there are whose bowels only act on alternate days; while, again, from sheer laziness, some people never have the bowels open until they are absolutely obliged. For example, a woman came to me a short time ago asking for some 'opening medicine.' She stated that, as a rule, the bowels acted regularly. On inquiry, I found that her idea of regularity consisted in taking medicine on Saturdays, and having a weekly clear-out, so that she might start afresh on the Sunday. This time she had had no action for three weeks, and she was beginning to be frightened. Two or three enemata were found necessary, and the result was appalling. She had felt no pain, had had no vomiting, and practically no discomfort.

The amount of a single action may be large in some cases of obstruction. If this be high up, it is not at all uncommon for the bowel below to empty itself of its contents. In some cases of gastro-enteritis there may be as many as fifteen to twenty watery actions in the day, and the loss of water in this way may be so great that the patient suffers from intense thirst, and fairly rapid emaciation may be produced. I have seen a case in which a child drank from a pot of red paint and shortly afterwards a profuse watery diarrhœa came on, which brought the patient to a state of dangerous collapse in the course of a few hours—in fact, saline infusion and enemata became necessary to save the child's life.

From consideration of the amount alone we cannot gain much knowledge of disease. Cases in which it might be useful are those who suffer from chronic constipation, and who, although taking the usual quantity of food, find that the motions are getting smaller and smaller, so that there is increasing difficulty in procuring an action at all. In such we may be on the look out for an acute obstruction supervening on a more or less chronic condition from fæcal accumulation, or possibly channelling of the fæcal matter. In any case of obstruction near the lower part of the intestine, such as the sigmoid or rectum, the stool may be found contracted and small, though the 'ribbon-shaped stools' described I have never seen unless the outlet itself is involved; for the shape of the stool is largely, if not entirely, modelled by the sphincter.

2. **The Colour.**—The stools may be of such a variety of colours that the consideration of this point alone is often of much help.

With a patient on a plain milk diet the colour varies from yellowish to white. In health, with an ordinary meat diet, the colour is dark from the presence of stercobilin, and if the quantity of meat taken is more than usual, the colour may be darker still, due, it is said, to hæmatin and iron sulphide.

The colour of the evacuations in some diseases is almost characteristic: the greyish yellow or ochry stool of typhoid fever; the 'meat washings' of dysentery; the tarry-looking stools which contain altered blood, as in cases of gastric and duodenal ulcer, and occasionally malignant disease. I have had one case during the last few months in which this point was of great importance. A man of seventy years, looking very well for his age, came up to the Ludlow Dispensary some five or six months ago complaining of constipation. There were no other symptoms of disease, except that he thought he might have lost a little flesh during the past year. He always ate very heartily, but took no trouble to get the bowels to work. He stated that injections were often necessary to ensure an action. As five days had elapsed without their being opened, and in spite of what he called the 'unrivalled Beecham,' an enema was administered, with good result, and the man returned home perfectly satisfied. I saw him six weeks later, when he came up again with the same complaint, but, in addition, said that he felt considerable discomfort at the pit of the stomach. He could not account for it, unless it might possibly arise—I use the patient's words—'from having eaten pretty heartily of simple suet-pudding,' of which he was very fond. He had taken about 1½ pounds of it at dinner, and washed it down with a quart of cider, which, he had been told, was quite a harmless drink. On relief of intra-abdominal tension by ordinary methods, this patient again seemed to get perfectly well; but about four weeks after this constipation became more troublesome, and an enema administered by his wife resulted in the passage of some fæcal matter, with quite a pint of tarry substance. He had certainly lost flesh, but had had no pain whatever. I fortunately warned his wife of the possibility of there being malignant disease present, considering his age, the more frequent recurrence of the constipation, and the loss of flesh, which she, seeing him constantly, had failed to notice. Within a couple of months this patient rapidly emaciated, pain became more marked, though not severe, till ten weeks had passed, and at the end of three months he died of carcinoma, which had become disseminated. Unfortunately, no permission for a post-mortem examination could be obtained, though it would have been interesting to discover where the original growth was situated to cause so little pain. The diagnosis in this case was made almost solely from the examination of the tarry stool.

The whitish or putty-coloured stool in which bile is deficient or absent is well known, but personal inspection by the medical attendant may again in these cases help considerably towards success in treatment by furnishing a guide as to the direction which the treatment should take. In this connection I may cite briefly the case of a patient to whom I was summoned but a month or two ago. He was a man of fifty-six years of age, emaciated, and complaining of alternating diarrhœa and constipation. He had been under the care of several medical men for this condition during the past two years. Each of these did him good for a short time, checking the diarrhœa or overcoming the constipation temporarily, whichever happened to be troubling him at the time—that is, the treatment had been purely symptomatic. None of his medical attendants, he said, had questioned at all minutely about the stools, nor had any of them requested to see one. He had been put upon a diet consisting almost exclusively of milk, but this led to a most troublesome flatulence, without giving any permanent relief. He had just passed a motion before my second visit, and I had requested at my first that, should he do so in the interval, it might be saved. It was a clay-coloured stool containing much undigested milk. This, therefore, which had formed practically the whole of his food for a long time, had not been absorbed, and consequently emaciation had become extreme, and he was to all intents and purposes suffering from starvation. Aiming at increasing the flow of bile, I prescribed pil. hydrarg. cum creta (3 grains) to be taken twice a week, and put him upon a more liberal diet. After a week the motions were darker in colour and more formed; the patient felt better, and began to put on weight, and he is now making good progress. In this case also, as has been shown, the diagnosis and the method of treatment depended entirely on an inspection of the stools.

The pale, yeast-like, drab-coloured stool of psilosis is not seen in England, as far as I am aware, so no further mention will be made of this here. I have seen two cases of it abroad, and the motions and associated condition of the mouth and tongue render the diagnosis almost unmistakable.

In children the changes of colour which take place in the stools may occur within so short a space of time that diagnosis can never with certainty be made from this symptom alone. Thus, an ordinary looseness of the bowels, due, it may be, to catarrh or to some dietetic error, may change quite suddenly to pale, putty-coloured motions from absence of bile, possibly owing to extension of the catarrhal condition, and this may pass still further to the more alarming stage of cholera infantum, with almost colourless 'rice-water' stools. And, since this latter may so rapidly prove fatal, it is most important in the case of children—more even than in adults—to make a point of having a napkin with the last evacuation kept for inspection. This simple precaution may save one from terrible mistakes. As an example, I may give the following : A mother brought her child, aged one and a half years, up to hospital, saying that he had suffered from diarrhœa for three days. After the first few motions blood and slime were present. She had taken him to a doctor when the blood began to appear, and he had said this was due to the frequency of the actions, and had given it grey powder, and had told the mother to administer a dose of castor-oil the following morning, and repeat the latter the same evening should the diarrhœa continue. This doctor, she said, had neither examined the child nor seen a motion. The patient was brought to the hospital because it seemed worse, and was passing more blood. On examining the napkin, only blood and mucus could be seen, and that was evacuated with much straining and intense pain. Palpation of the abdomen revealed a large sausage-shaped tumour on the right side.

Want of examination and the consequent treatment of an acute intussusception by purgatives cost this child its life.

Green-coloured motions are by no means uncommon in the diarrhœa of children. This colour, when it arises in the course of ordinary simple diarrhœa, is believed to be due to an excess of biliverdin or to the conversion of bilirubin into biliverdin. Some are yellow when passed, but acquire a greenish tinge on being left.

The stools of infants may be green also from the action of a bacillus, described, I think, by Le Sage, which forms a pigment of this colour. Such a form of diarrhœa is contagious. One of the main points of difference between the former and the latter (bacillary), and one which will readily enable us to decide which it is we have to deal with, is that in the former the stools are acid in reaction, and contain a considerable quantity of bile, whereas the latter are usually neutral, and give a negative result when tested for bile. The diagnosis is important, for the treatment is quite different in the two cases, the former requiring alkalis, such as mist. cretæ, with a little spirit. ammon. aromat., while the second, as a rule, readily clears up after a few 1-drachm doses of 2 per cent. lactic acid. Moreover, being contagious, it calls also for disinfection of the soiled napkins. The treatment, however, I cannot dwell upon, as this question is outside the scope of the present paper.

The colour of the stools may, of course, be greatly influenced by medicines. Thus, a child who is taking santonin for getting rid of ascaris, for example, may pass bright yellow motions. Decoction of hæmatoxylin, not infrequently given for diarrhœa, changes the motion to a violet (logwood) colour, and may impart the same to the urine, often to the intense trepidation of the parents, if warning of this possibility has not been given. Calomel, especially if given to young children, may render the evacuations green, owing to the biliverdin present. The black stools resulting when a patient is taking charcoal, or salts of bismuth, or iron, are a matter of common knowledge. Finally, in some cases of constipation the scybalæ may be externally reddish, from a coating of blood due to associated hæmorrhoids.

3. We pass now to a description of the **consistence and general characters** of the stools in certain diseases, excluding for the present the various abnormal ingredients which may

be found. These will be dealt with in the succeeding section.

(1) In obstructive jaundice there is usually constipation, and therefore a small, infrequent, slate-grey coloured motion ; but inasmuch as bile is also an antiseptic to some extent, its absence allows a further degree of decomposition of the intestinal contents to take place, and this, by setting up irritation, may lead to diarrhœa replacing the constipation. The same result may be due to the catarrhal condition of the upper part of the bowel, which by its extension has caused the jaundice. The clay colour often present arises in part from the large percentage of undigested fat. Also, as a result of the decomposition due to the absence of bile, such stools are exceedingly offensive.

(2) In the early stage of typhoid fever there is nothing characteristic : the stools may be merely loose and increased in number ; later they become liquid, alkaline, offensive, of greyish-yellow, ' pea-soup ' colour, and they may contain curds of undigested milk. In about 50 per cent. or more these characters may not be observed, as the diarrhœa is due to associated catarrh, not to the amount of ulceration of the bowel, and constipation may be present. The character of the motions may be of aid in diagnosis, as in afebrile typhoid. I have seen no case of this in England, but in South Africa, where I was in medical charge of the enteric division of No. XIII. General Hospital, having constantly 125 cases of this disease under observation, I came across four who passed through an attack almost typical except for the practical absence of temperature.

In the presence of the general symptoms of typhoid fever, examination of the stools is important in directing not only diagnosis, but also prognosis and treatment. The so-called camp fever, or Pretoria fever, of which I made a study in South Africa, has all the initial symptoms of enteric fever, and is, in my opinion, a mild or abortive enteric. The ' staircase ' rise of temperature, perhaps early bronchial signs, the flushed face, comparatively slow pulse, headache, etc., of the first week may all be present, but not the rash. These cases were frequently sent into hospital as typhoid fever, and there was every excuse for this diagnosis in the early stage. I, therefore, always had a dozen beds set apart as an ' observation ward.' The stools were rarely pea-soup-coloured, and the temperature fell, as a rule, about the tenth to fourteenth day of the disease. Some have ascribed this condition to the *Bacillus enteritidis sporogenes*, but from my own observations, which were fairly numerous, I venture to differ from them. I think, as already stated, that they are cases of mild typhoid fever, for the following reasons : If, when the temperature fell, the tongue rapidly cleaned, the patients progressed satisfactorily. They were hungry, and usually clamoured for solid food throughout the illness, and if the tongue cleaned with the fall of the temperature, solid food was taken with impunity, and convalescence was rapid. In several cases, however, the patients looked quite as well when the temperature dropped, and asked most piteously for food, but the tongue remained furred. Now, I repeatedly noticed that, in spite of the general condition of the patient seeming so good, if the cry for solid food was yielded to before the tongue was quite clean, a relapse occurred, and—this is the important point—the relapse was not a repetition of the former short illness, but a typical typhoid fever attack, with pea-soup stools, rose spots, and so on. This interesting point I must not dwell upon longer, as it hardly comes within the province of this paper, except in so far as it should compel us to ask to see a stool in all cases where the general symptoms point to enteric fever.*

(3) The initial stools of acute intussusception are merely the contents of the bowel below the obstruction, and are not

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* Since the above was written I have had one more such case to add to the list. I was called to see the patient, a boy of twelve years of age, in consultation on Christmas Day, 1906. The medical man in attendance, having never seen such a case, had told the parents that the child was suffering from typhoid fever, though there was no rash and the illness had commenced with fever and shivering five or six days previously. The child had not complained of any headache, though the temperature had risen daily for the first five days to 102° in the morning, and 102·6° in the evening. He was anxious to get up, as he did not ‘ feel ill enough to stay in bed ’; also, it was holiday-time. At the parents’ request, I was asked to see the child with the practitioner in charge of the case, and found the symptoms above detailed. One was able to say that the fever would probably drop within a week from that date, and that, if the tongue cleaned, an increase in diet might be cautiously allowed. I heard afterwards that the temperature became normal on the tenth day of the illness, the tongue cleaned by the twelfth, and convalescence was uninterrupted.

characteristic. After that, however, there will be small actions associated with the passage of blood and mucus. Except for this, obstinate constipation is present. In dysentery, for which I have known intussusception to be confused, there is fæcal matter mixed with the mucus and blood. There is considerable irregularity, and often remissions, mucus and blood being present at one time, some fæcal matter at another. Examination of the abdomen, revealing a tumour in the first case, and, if necessary, a microscopical examination of the fæces for the amœba in the second, would clear up the diagnosis. But even by naked-eye examination the mistake ought not to be made, for in every case of suspected dysentery the stools should be washed, and washed thoroughly, the fluid and fæcal matter being decanted each time, when the finally remaining 'meat-washing' character of the residue is fairly distinctive.

(4) In lienteric diarrhœa the stools are often large and gruel-like, containing food practically undigested, as though it had been hurried on through the bowel as soon as it had passed the stomach. This is in children by no means infrequently seen where thread-worms are present.

(5) In some diseases of the pancreas, owing to the loss of the fat-splitting ferment, the stools contain a large proportion of undigested fat. This condition, in the absence of jaundice, or of a meal particularly rich in fats, may be of considerable aid; but without going into a detailed and elaborate chemical examination as to the proportion of the fat in the fæces to the amount of fat digested, diagnosis cannot safely be made on this symptom alone.

(6) In choleraic diarrhœa the thin, serous, alkaline discharges, containing flakes of mucus, and giving the typical 'rice-water' characters, are seen.

(7) In colitis, proctitis, and disease of the large intestine generally, there is nearly always an excessive amount of mucus, and not uncommonly streaks of blood. But where there is considerable destruction of mucous membrane, the stools may resemble more closely those described under lienteric diarrhœa, absorption by the bowel being deficient, and the contents passing rapidly through the intestinal canal. This point will be more fully dealt with in the following section, when speaking of abnormal ingredients.

(8) In diarrhœic conditions in children the evacuations may

present great variety, but it is only in a few instances that these appearances are of diagnostic value. Thus, in ordinary chronic diarrhœa they may be at first merely more frequent, liquid, yellowish, offensive motions, occasionally showing streaks of blood, with intervals of constipation. At another time they may be lumpy and green, or, again, the tinging with bright blood may become darker, or ‘ chopped spinach ’ particles (said to be due to altered blood) are visible. A few large yeasty motions may be found alternating with smaller constipated ones.

Many of the forms of diarrhœa in children arise from faulty methods of feeding, and inspection is almost more important in infants and young children than it is in adults, since the remedy is often so simple—namely, the regulation of diet. For example, milk in the majority of these little patients causes constipation, and this, by setting up a catarrhal condition of the bowel, causes an alternating diarrhœa ; but in others a milk too rich in cream may of itself be the cause of a persistent diarrhœa, with the passage of undigested fat and milk in the stools. I lately saw a case in which, in consequence of the steady downward progress and wasting of the patient, the milk which the child had been taking had been enriched with cream in increasing proportion, in order to ‘ fatten it ’ and counteract the wasting. The motions, needless to say, had not been examined. Stopping the cream and a further dilution of the milk soon resulted in a cessation of the diarrhœa, and the patient since this slight alteration was instituted has steadily gained in weight, and from a puling, whining infant, has become a well-nourished, healthy child.

4. **The Presence of Abnormal Ingredients.**—Several points which might have received attention in the preceding paragraphs have been omitted, because they can be more conveniently studied in the present section, dealing with abnormal ingredients which may occur in the stools. The commonest of these is—

(1) *Mucus.*—If this is present in such amount as to make up almost the entire motion—as in dysentery, for example—the condition giving rise to it is situated in the large intestine. If intimately mixed with the fæcal matter, we may usually say with certainty that the small intestine is the seat of the disease. There are exceptions to this—*e.g.*, in acute intussusception, after the lower part of the bowel has emptied itself,

motions of mucus and blood are passed with distressing tenesmus.

The passage of mucus is a common symptom in all forms of chronic obstruction, especially in chronic intussusception, fæcal accumulation, and, associated with broken-down tissue and perhaps pus, in carcinoma.

With a muco-purulent, gelatinous discharge, often passed with considerable pain, inquiry into the history for syphilis should be made, as such cases are not infrequently diagnosed as carcinomatous or tuberculous ulceration, and a wrong diagnosis being given, delay in proper treatment is caused.

In constipation the presence of scybalæ leads to increased secretion of the mucous glands of the lower bowel, so that small lumps may pass coated with mucus, and the catarrhal condition set up from irritation by retained fæces gives rise to a spurious form of diarrhœa. Mucus is also present in the stools of tuberculous disease of the rectum, and in the more local conditions of fissure and polyp.

In colitis, both the simple and ulcerative forms, and in dysentery mucus is found, and often blood also, and in the disease of children commonly called colitis this substance may be present in large quantity. The term is a misnomer, for, according to Eustace Smith, who first described it, there is no inflammatory condition to warrant the name 'colitis.' The affection appears to consist in a flow of mucus so excessive as to coat the bowel and prevent absorption of food, and emaciation consequently follows.

The presence of large numbers of the thread-worm *Oxyuris vermicularis* excites an excessive secretion of mucus, which will appear in the stools. The reverse proposition, so to speak, of this may play some part—namely, that there must be a certain state of the bowel which will allow the worm to flourish, a vicious circle being thus maintained.

(2) *Blood.*—If this comes from the upper part of the intestine, the bright colour is changed in its passage down the alimentary canal to a black, tarry mass—melæna. This may be due to hæmorrhage from gastric or duodenal ulcer, to blood passing into the stomach from varicose œsophageal veins in cirrhosis of the liver, the blood not being removed by hæmatemesis, also to bleeding from a typhoid ulcer, and in malignant disease of the upper part of the intestine.

The stools will be black, of course, if bismuth has been given, for example, for the gastric ulcer, and it is important to know whether the colour is due to the drug or to hæmorrhage. Without the trouble of examining microscopically for corpuscles or hæmatoidin crystals, if a part of the tarry mass be well diluted with water the colour, if due to blood, will be seen to be distinctly red. We must, under these conditions, make sure that logwood has not been administered, as it may have been for diarrhœa, since this substance will also impart a reddish colour to the motions.

If the blood in the stool be bright red, it is rarely mixed intimately with the fæcal matter. Thus, it may occur apart from any motion in hæmorrhoids, or it may coat the scybalæ when constipation is associated with the same condition, or with fissure, polypus, etc. In children the last-named is by no means uncommon as a cause of profuse bleeding. Occasionally, when hæmorrhage is moderately large, and does not stay for any length of time in the alimentary canal, the blood, although from the small intestine, may be red, and not tarry, as in enteric fever, and blood diseases as purpura. The escape of red blood from the bowel in this last affection I have thrice met with. Any condition in children associated with diarrhœa may lead to the presence of blood in the motions. If merely due to the intensity of the diarrhœa, the amount is usually quite small, mere streaks appearing on the napkins as a result of the excessive congestion, or to the partial prolapse of rectum induced.

(3) *Undigested food* is seen in cases of so-called intestinal dyspepsia and lienteric diarrhœa, in which condition the contents are hurried through the bowel too quickly for adequate digestion and absorption to take place. In enteric fever it is most important to examine the dejecta at least once daily, in order to ensure that no undigested milk is passing through the small intestine, as the casein lumps might easily cause perforation of a deep ulcer.

(4) *Fatty matters* are present in the stools of patients suffering from some pancreatic affections, owing to the absence of steapsin. I found the routine examination of dejecta, which I try to make in all patients with gastro-intestinal disorders, of great diagnostic value in this connection lately. In September, 1906, a woman of thirty-four years of age came to see me. She had been under treatment elsewhere for close on two years for ‘ dyspepsia.’ She had had

acute attacks of vomiting, with abdominal pains at intervals, this pain being situated at the epigastrium and adjacent part of the right hypochondrium, but very localized, associated with symptoms of collapse and faintness. During the intervals between these acute attacks she suffered from more or less flatulence and diarrhœa. She had lost flesh considerably, but the upper part of the abdomen had enlarged. From a detailed history of her case, and from the results of physical examination, I suspected pancreatic mischief. I requested that a stool might be saved for me to see on the following day, and that a specimen of her urine might be sent to me. The former showed undoubted presence of fat from its greasy nature, and a small quantity taken and examined by microscope confirmed this. The latter (urine) at the time was normal, but on one occasion about four weeks later Fehling's test for sugar gave a positive result.

In children about the time of weaning, when the intestinal glands are not quite in regular working order and changes in diet are being made, fatty and oily stools are not infrequently seen, probably owing to the pancreas, liver, and other glands not performing their functions satisfactorily. The condition will often clear up on the administration of a mild cholagogue aperient and the use of liquor pancreaticus.

(5) *Pus* may be found in small quantities where there is ulceration of the lower part of the alimentary canal; but large amounts may be suddenly discharged, owing to the opening of the abscess into the bowel. I have notes of one case of appendicitis in a young girl of thirteen years of age, in whom an enormous abscess developed, starting in the right iliac region, and in ten days from the onset of her illness reaching the size of a small melon, and extending even beyond the middle line. Her parents refused to entertain for one moment the suggestion of operative measures. On the twelfth day of the disease the tumour suddenly vanished, and more than 1½ pints of pus escaped by way of the bowel. For two days small quantities continued to come away, and the patient fortunately made an uninterrupted recovery.

(6) *Gall-stones* may be found, and should be searched for, if a history of a recent attack of biliary colic be obtained, by repeatedly washing the stools over linen, and so filtering off the fæcal matter slowly. Search for the *head of tænia* may be similarly performed, or by washing and decantation, in order to ensure that the worm has come away entire, and

that a recurrence of its growth will not take place. Two years ago I removed 33 feet of a tapeworm, the longest I had ever seen, from a man in Johannesburg (where everything seemed to be done on a large scale), but I was unable to discover the head; and true enough in about four months' time he came up again for treatment, this time with a successful result.

(7) In membranous colitis and dysentery definite *casts of part of the lining membrane of the large intestine* may pass with the fæces. To examine for them water must be added and the fæcal matter decanted off. The process may have to be repeated again and again till the casts or shreds are left floating as pale, whitish skins (resembling and sometimes mistaken for pieces of sausage-skin), which can then be viewed under the microscope.

(8) Lastly, the stools may have to be examined for *foreign bodies*, when such have been swallowed by children. An instance of this was related to me by a fellow-practitioner, where a child placed a half-sovereign in its mouth, and inadvertently it slipped down the throat. The doctor was summoned an hour or so afterwards, and naturally the only advice he could give was that an aperient should be administered, and that the parents should watch the motions for its reappearance. The coin was obtained some thirty-six hours later, the parents in the meantime having examined every motion by scrupulously careful washing and decanting with a zeal worthy of a better cause.

I have not attempted in this paper to discuss other symptoms by which a diagnosis may be arrived at or confirmed when the indication has been given by examination of the stools. Such do not come within its scope, since my aim has been merely to show how important this point of inspection of the dejecta is, and how all too frequently a valuable diagnostic aid is not taken advantage of, owing to neglect of this simple procedure. Nor have I entered into the deeper subject of evidences of disease which may be obtained by microscopical examination of the fæces, such as the discovery of the amœba of dysentery, the *Balantidium coli*, the ova of *Ankylostomum duodenale*, etc., for the busy practitioner has not the time to spare for this, and there are several well-equipped clinical laboratories in different parts of the country where such examinations can be carried out more thoroughly, more accurately, and with greater facilities.

VIII

REPORT OF A SEVERE AND PROLONGED ATTACK OF ENTERIC FEVER, WITH COMPLICATIONS

THE case about to be described is of interest for two reasons: firstly, as showing a somewhat more severe type of enteric fever than one is accustomed to meet with in private practice; and, secondly, on account of the exceptional degree of the 'personal element' on the part of the patient, which had to be taken into consideration. A knowledge of the methods of dealing with this element can be gained only by experience, but, nevertheless, in many cases constitutes half the treatment, and, as most general practitioners will agree, not infrequently the more important half. In a prolonged and trying illness such as enteric fever may be, the gaining and retaining of the confidence and good-will of the patient may make all the difference between recovery and a fatal issue: for, as all have seen, a seemingly mild attack of such a vitally depressing affection in a patient who appears from the first to have made up his mind that he will not get over it often terminates fatally, while the apparently hopeless cases, who keep cheerful, and, so to speak, have made up their minds that they are going to recover, even after repeated relapses, pull through in the end.

The patient was a woman, thirty-four years of age.

Family History.—Father living and well; mother dead, but the cause of death is not known. Patient has four brothers and two sisters, all living and healthy. In fact, the family history is remarkably good.

Previous History.—There is no history of any previous illness, with the exception of so-called 'epileptic fits,' which started when patient was fifteen years of age, and continued at irregular intervals until a year ago. She then became a vegetarian, and to this she ascribes the fact that she has not since suffered from fits. She occasionally has 'bilious attacks.' Menstruation began at the age of fifteen, and has always been regular. She is also, according to her own description, a 'homœopathist,' which seems to mean in the present instance that she plays with dangerous drugs in small doses on slight provocation, such as taking mother tincture of aconite for a cold, gelsemium for headaches, etc.

History of Present Illness.—The patient first began to feel ill, with headache and nausea, on Saturday, August 11, 1900. She states that she took aconite in various doses, and seemed better on the following day. On the 13th she again felt worse, was generally ill, and vomited once. She had no diarrhœa nor abdominal pain, but a severe aching in the back and legs. Her sister, who slept with her, says that she seemed very hot and feverish. The next night she 'groaned and rambled a good deal in her sleep.' Her condition remained about the same on the 14th. The father stated that he considered her present attack might be due to smells from bad drains adjoining their own 'privy' and belonging to the next house. At the patient's request, he again administered aconite in 'homœopathic doses,' but without effect, and he then sent up for me.

State on Examination.—August 14, 1900: Patient is well nourished, and looks only about twenty-six to twenty-eight years of age, but is said to be thirty-four. She complains of intense headache, and pains in the lower part of the back, which have continued with slight intermissions since the 11th instant. She looks ill; the eyes are dull and heavy, the tongue dry and red, furred in patches, especially near the middle. There are no physical signs of disease in heart or lungs. The abdomen moves normally on respiration, and is normal to percussion, but somewhat resistant on palpation. The liver is not felt; it is doubtful whether the spleen can be felt or not, but it seems to be enlarged as far as splenic percussion goes. Gurgling is perceptible in various parts of the abdomen, especially over the right iliac region, and pain is elicited on deeper pressure there. No spots of any kind are visible on the trunk, limbs, or face.

When seen at 9.30 p.m. the headache was most intense, but during the day it had not been so severe. There had been a slight action of the bowels the same afternoon, but the result had been taken away. The temperature was 103·4°, pulse 100, soft, regular, and easily compressible.

On the supposition that the case might possibly be one of enteric fever, general directions were given as to disinfection of stools, urine, and the disposal of them, also as to care in handling the patient or her bedclothes, washing of hands, and so forth.

She was given antipyrin, 10 grains, of which 5 grains were to be taken immediately, the remainder in half an hour if the headache was unrelieved ; each dose to be taken with a cup of tea or a little whisky. Diet was to consist of plain milk and soda-water, and the following saline mixture was prescribed :

℞	Liq. ammon. acetat.	ʒii.
	Spirit. æther. nit.	ʒss.
	Spirit. chloroformi	♏x.
	Aq. camphoræ	ad ℥i.

Sig.: Every four hours.

It was found necessary to give both parts of the powder (antipyrin), after which the patient slept for six hours, and awoke with the headache considerably relieved. The temperature was reduced to 102·4°, but the pulse had risen to 120. She said that she never cared much for milk, partly because of the taste, partly because of her vegetarian principles, but she took it fairly well. She suffered a good deal from thirst, and took lime-juice to quench it. There was no action of the bowels during the next twenty-four hours, and the abdominal symptoms remained the same. She had a slight cough, but no physical signs could be found in the lungs to account for this.

She took some Eno's Fruit Salt, and an action of the bowels followed four hours later. The stool was kept, and at my evening visit I saw that it was a semisolid motion of greenish yellow colour.

On the next day her headache was again troublesome, but not so severe as before. The patient was, however, more cheerful and took her milk well. Pain was elicited in the abdomen on very light palpation, but there was no complaint of spontaneous pain, though the whole of the abdomen was more rigid than it had been up to this time. Two doubtful spots were present—one on the chest at the second left intercostal space close to the sternum, the other on the right buttock. There had been another stool, small, but similar to the last.

At 8 p.m. on the same day, August 16, the temperature rose to 107·4°, the highest I personally had ever met with, and the patient seemed very drowsy, but the headache, she said, had greatly improved. I sponged her for twenty minutes, and the temperature came down 4°. The saline mixture was ordered to be given every three hours, and word was left for the patient to be sponged again if the temperature rose above 103·4°. This was the standard given throughout the illness.

I was desirous to obtain trained nurses for her, but her sister was most anxious to take on the work, and the patient herself was very averse to being nursed by a stranger.

During the ensuing night sponging was required twice, but resulted in a fall of only 1°.

The following day the temperature at 6.30 p.m. was 104°, and sponging for twenty minutes made no difference whatever. There was more abdominal pain; the tongue was moist, and covered with white fur except at the edges. Menstruation began on the morning of the 17th.

The same night at twelve o'clock I was sent for because the patient was intractable, and would not permit any more sponging, although her temperature was 106°. On my arrival I found her as described, and gave her salicylate of sodium 10 grains, with sal volatile 15 minims, to be repeated in two hours if the temperature was higher than 104·6°. This second dose was not required, the temperature falling to 103°. The former saline mixture was stopped. During the next twenty-four hours the temperature kept about 0·5° lower than on the previous day, but the pulse was quicker—112 per minute. Headache was much less severe, and the patient slept fairly well through the night, and had one period of three hours' continuous sleep. After this she lapsed at times into delirium. The bowels had not been opened for two days, and patient wished for a glycerine suppository in preference to an enema; this was given, but was ineffectual. On the 20th, therefore, an enema was administered, with a very satisfactory result.

Three fresh spots appeared on the 21st—lenticular, rose-pink, typhoid spots—and those noticed on the 19th were beginning to fade.

The same evening the patient stated that she was unable to pass her water: there had been no difficulty hitherto. The bladder was slightly distended, but there was no pain. Fomentations were applied over the bladder, and a 'very little urine' passed. A few hours later the bladder was obviously becoming very full, and fomentations were no longer effectual, so I threatened the use of a catheter if no water passed within an hour. About fifty minutes after this the patient passed a large quantity, and never had any further difficulty in that respect during her illness. She continued to take plenty of milk, but complained that she was not being given any regular medicine, so a placebo of tinct. iodi (3 minims in water) was ordered. She would not take it in the ordinary way, but on her homœopathic principle of placing the three drops in half a wineglassful of water, and taking that thrice daily.

On the morning of August 23 temperature fell to 101°, but a few hours later rose to 103·5°, and was brought down only 1° by sponging. The bowels were confined, so beef-tea or Liebig was ordered. This she did not like, saying that she preferred milk. Slight crepitations were audible on this day at the base of the right lung posteriorly, but nothing elsewhere.

During the ensuing twenty-four hours the patient took 3 pints of milk, but began to complain of a nasty taste in the mouth. The tongue was cleaned with borax and lemon, and a mouth-wash containing tinct. myrrhæ and citric acid prescribed, which the patient found very soothing and refreshing to the mouth.

With the exception of an attack of vomiting on the evening of the 24th, for which I could discover no obvious cause, things remained in the same condition until the 28th. On that date I have the following note:

'Patient has not been so well during the last twenty-four hours. There are crepitations behind at both bases—less on the left than on the right, where they reach up to the angle of the scapula. Pulse yesterday was 120. Brandy (3 ounces) given in the day, and beef-tea in place of some of the milk, as patient feels sick after the latter. Since she objects to brandy, champagne (6 ounces) has been substituted for it to-day. There is some spontaneous pain in the abdomen, which is increased on palpation. In the last twenty-four hours patient has taken milk (2 pints) and beef-tea (1 pint).'

On the 31st she seemed and felt better, and the temperature was, on the whole, a little lower, but she complained of pain in the right side on deep breathing. On listening with the stethoscope a friction rub was audible below and to the right of the right nipple over a space the size of half a crown. A mustard-leaf applied over this area soon gave relief, and the following morning the patient stated that she felt much easier; there was little or no cough, and the temperature was only 99·8°. The same evening I was again sent for, as she did not feel so well, and the fever had risen to 103·8°. During the afternoon it had reached 105°. The patch of pleuritic friction had increased in size to that of the palm of the hand; breathing was painful, but there was very slight cough. Some fresh spots had appeared, and the patient seemed more dull and heavy, and the tongue was dry and covered with a brownish fur. Pulse 136. During the day she took milk (2 pints), beef-tea (1¼ pints), and brandy (4 ounces).

On September 4, the twenty-fifth day of the disease, matters began to look more serious. I quote from my notes on that date: 'Patient has had a bad day, feels very listless, and the temperature has been higher. At my visit I found it was up to 105·2°, so sponged her myself, and brought it down to 100·2°, but within a short time there was a reactionary rise to 103·8°. Diarrhœa is coming on: six actions during the last twenty-four hours—three in night and three in day; therefore stopped the beef-tea.'

Sponging was required six times within the ensuing twenty-four hours, although the temperature was brought down to about 101° each time. Orders were given that if the fever again rose sufficiently high to call for sponging, a dose of the salicylate mixture was to be given instead. This was accordingly done at 4 a.m., and again at 5 p.m., and the temperature, on the whole, remained lower, averaging about 103°; the pulse was rapid—130. She had taken nourishment badly during the day.

On September 7 more alarming symptoms declared themselves. At 6.30 p.m. she had a large hæmorrhage by the bowel, fully a pint, followed by a rapid fall of the temperature. At 6.30 p.m. it was 104°, at 7.30 p.m. 101·2°, at 9.30 p.m. 98·4°. Liquor morph. hyd. (15 minims) was ordered to be given by mouth every six hours; but bleeding stopped shortly after the first dose, and in about an hour she passed a motion largely mixed with blood. Four hours and three-quarters after the first hæmorrhage, at 11.15 p.m., there was a second, which was almost as large as the first; another dose of the morphia mixture was given, without waiting for the six hours' interval to pass, and also a starch injection. Temperature at 11.30 p.m. had dropped to 97·2°; pulse was very small and rapid. Crushed ice in flannel was applied to the abdomen. The temperature remained low all day on September 8, varying from 97° to 99·6°, but no further bleeding occurred. The pulse was very weak and lips blanched; the patient slept fairly heavily the night through, probably owing to the exhaustion and in part to the morphia mixture. As she had such a great objection to the brandy, a carminative mixture containing spir. ammon. aromat. was prescribed in its place.

Next day, September 9, and the thirtieth day of her illness, the temperature and pulse were again tending to rise, and three fresh spots appeared. On the 10th there was a small hæmorrhage at 1 p.m., when her sister gave her another dose of the morphia.

The pulse becoming very rapid again, and the patient having such a rooted objection to brandy and to the sal volatile mixture, both of which, she says, now make her feel sick, liquor strychninæ and tinct. digitalis, of each 3 minims, was ordered to be given every four hours in water. The temperature had been on the average 104°, and neither sponging nor salicylate now seemed to have any effect—at all events, no lasting effect—and repeated sponging appeared to cause considerable exhaustion, so phenacetin (2 grains) was prescribed to be given every four hours while the temperature remained high.

Another hæmorrhage, but not a very large one, occurred twenty-four hours later. The temperature fell with this to 101°. The patient seemed very weak, and her strength, I feared, was giving out, since she had now gone through thirty-two days of an exhausting illness, with high fever throughout, and at the back of it all the constitution of a vegetarian. She complained the same evening that the pain in the right side was returning, and on examining there friction-sounds were again marked. The phenacetin appears to have more power in these small doses of keeping the temperature in check when used at regular intervals, and exhaustion of the patient by frequent sponging is avoided. The temperature, with one exception on the 12th, when it reached 102·6°, never rose above 101°, and rarely above 100°, during the remainder of her illness.

On September 15, shortly after an enema had been given (the bowels not having acted for the previous forty-eight hours), an attack of diarrhœa came on, the patient passing one motion in such quick succession after another that there was barely time to change the pads. This, however, was fortunately soon checked by a dose of the same morphia mixture. Beef-tea was stopped, and the patient took milk well, 3 pints in the day and 3 ounces of brandy, to which she had by this time returned. The bowels were a little relaxed the following day, there being three loose actions, but all trouble in this respect cleared up after this.

On the 20th there were three small scybalous motions, with fresh blood on them; but as there was a complaint of pain at the anus when the bowels acted a rectal examination was made, and one or two small hæmorrhoids felt. The patient was evidently taking a turn for the better, for I have the following note on this day, September 20: 'The patient is taking milk well, and no longer feels sick; the temperature, which twice reached normal yesterday, has been slightly higher to-day, but she has been sneezing, and thinks she has caught cold. Has been, consequently, asking for aconite, but was persuaded to take an ordinary saline mixture with a little ammonia in it. There is no abdominal pain now; the same friction-sounds are to be heard at the right axillary region, but no pain felt even on deep breathing; the basal crepitations behind are diminishing.'

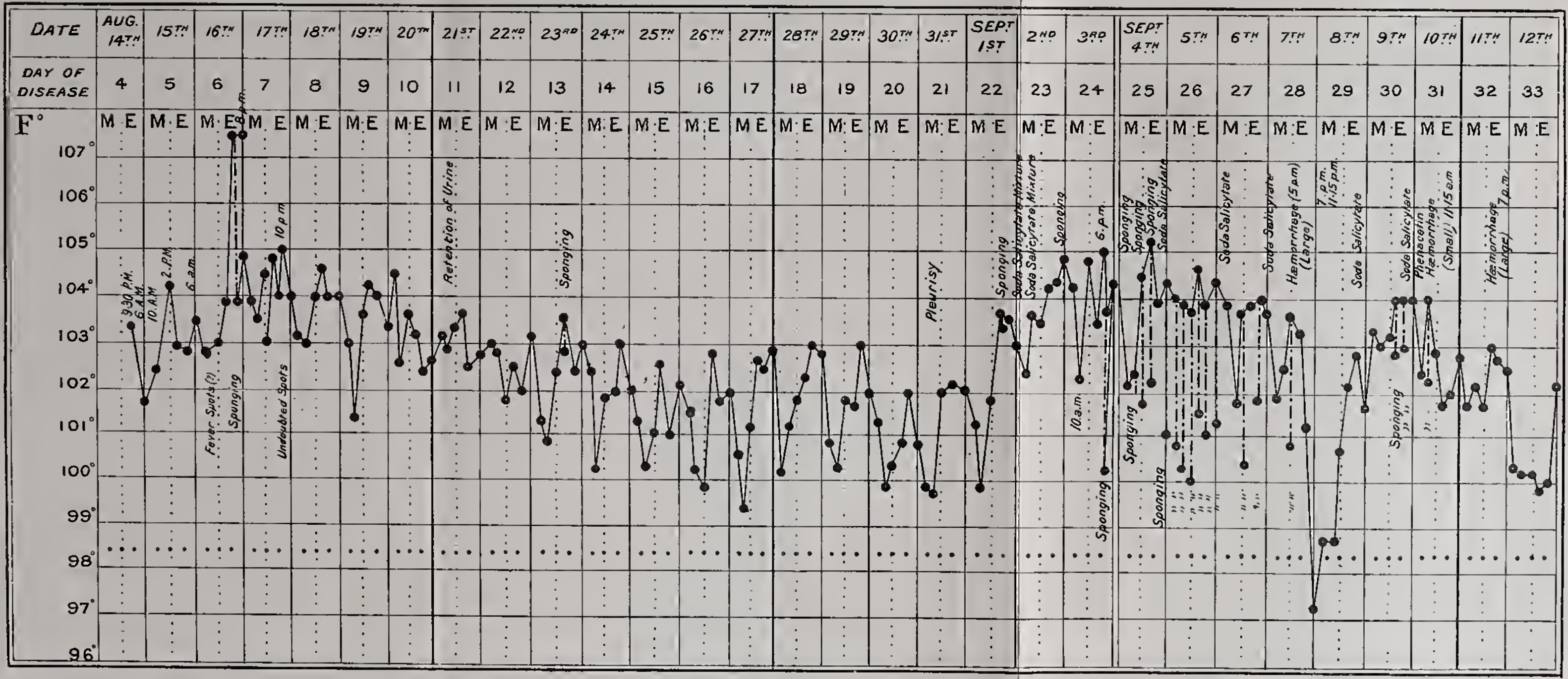
Everything from this date went on very satisfactorily, and I find that I made a final note on September 30, the fifty-first day of the disease, from which I quote in conclusion: 'Patient's temperature has been normal for the past week. She has been sitting up in bed for thirty to forty-five minutes twice daily for two days. On the last three days has had a little sole at one meal in the day. She strongly objects to custard or milk puddings. She looks better, and is brightening up more every day. Pulse 80, regular, gaining in strength. The brandy has been stopped, and the following tonic prescribed in place of the strychnine and digitalis mixture:

℞	Tinct. ferri perchlor.	♏x.
	Spirit. ammon. aromat. . .	♏x.
	Syrupi	♏xx.
	Aquam	ad ℥i.

Sig. : Ter die.

[This, though incompatible and theoretically full of faults, I find one of the best ways of giving iron, for the patients like it, and the iron is readily absorbed.] Having had sole, eggs, beef-tea, etc., and what she calls 'medicines in allopathic form,' she has forsworn both vegetarianism and homœopathy.

I regard this case as one of much interest, owing to the length of time the affection lasted, considering there was no relapse to prolong it, and also on account of the constant watching required to meet the numerous difficulties which seemed to rise up and confront one; for no sooner was one overcome than another, and usually a more formidable one, would take its place. Firstly, the vegetarian and homœopathic ideas had to be met and answered, then the nursing question; with respect to the illness itself, the very high fever within so short a time of the onset; later, the pleurisy and the repeated hæmorrhages. I attach a copy of the temperature chart, which shows graphically several of the points of interest in this case.



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IX

SYPHILIS IN THE ARMY, AND ITS INFLUENCE ON MILITARY SERVICE: ITS CAUSES, TREATMENT, AND THE MEANS WHICH IT IS ADVISABLE TO ADOPT FOR ITS PREVENTION

1. Syphilis in the Army.

EVER since the historical records of national crises in which a foreign army played a part have become reliable, and wherever medical matters are mentioned in connection therewith, venereal disease has almost invariably received notice, usually a large share of notice; and, later on, as the differential diagnosis between the various venereal affections became established, it can readily be seen that syphilis was the 'dread disease' so often referred to.

Probably the worst epidemic of syphilis ever described, at all events in Europe, both as regards virulence and widespread character was that of 1495, when Charles VIII. of France, having invaded Italy, claimed Naples as his by hereditary right, and quartered his army there. The following year, with the help of the Spaniards, the Neapolitans succeeded in expelling the French, but during these two years syphilis proved a terrible scourge in that country. The probable reasons for its being so exceptionally severe were (just as is seen, though to a less extent, contributing largely to the severity of bad cases at the present time) the disregard of all common-sense rules of hygiene and personal cleanliness, coupled with the degree of dissoluteness to which men at that time had fallen; the general unhealthiness of the country, owing to floods, alternating with drought; malignant fevers of various kinds; and the more than probable presence of scurvy among the troops. The effect of unhygienic conditions in increasing the severity of the disease is evidenced also in the medical history of the Thirty Years' War, when Finland, a country previously comparatively free from syphilis, suffered from a devastating epidemic. Further, history reports sad ravages of the disease in America after its discovery by Columbus, and again in Spain on the return of his soldiers from that country, and later in Hispaniola and the West Indies, as commerce was set up between these countries and Spain.

It is a matter for comment also that, though looked upon morally in individual cases as a more or less trivial matter, nevertheless in the abstract syphilis should be regarded with so much aversion that each nation in naming the disease endeavoured to foist upon some other the opprobrium of having introduced the disorder. Thus the English people originally called it the 'French disease'; the Portuguese, as commerce extended to them from Spain, gave it the name of the 'Spanish disease'; while the Spaniards, in their turn, attributed it to America. Some savage races, as the Sandwich Islanders, have denominated it the 'English disease,' and, finally, the Indians and Cingalese call a closely allied, if not identical, affection, 'parangi,' or the 'foreign disease.' As regards the identity of parangi, yaws, or frambœsia, and syphilis, it is not within the scope of this essay to discuss the evidence. The matter is still *sub judice*, some high authorities (particularly Mr. Jonathan Hutchinson) maintaining that they are one and the same disease, though at the present day the main weight of argument appears to be against this supposition.*

The few instances above given will suffice to show how close the connection seems to be between syphilis and the military; and though to some extent remedied at the present day by enlightenment of education and improved hygiene, general and personal, yet the scourge remains a terrible one even amongst our own army. Thus, in one year in India, in an army of 70,642, there were 44,395 cases of venereal disease, of which 31,953 were under treatment for syphilis. No one who has seriously studied the subject of syphilis can help being struck with astonishment at the appalling number who suffer from its ravages. It is a moot point whether there is actually a higher proportion of cases of the disease in the army than is to be found among the civil population; for in the former record of some sort is made of every case under treatment, whereas amongst the latter no record is kept of the large numbers who come under the care of private practitioners. But so far as can be ascertained from imperfect data, it is stated that considerably more than half the young men of the higher and middle classes of society suffer or have suffered from venereal affection in some way or other, and, judging from statistics of civil hospitals, syphilis among the lower classes is not only very common, but is frequently seen in a severe form.

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* Sir Patrick Manson, 'Tropical Diseases,' p. 465.

It is a very great mistake to look upon syphilis as a trivial complaint, and the contraction of it as a mere peccadillo, a 'venial sin,' a 'piece of bad luck'; and if such a point of view (which one regrets to say is largely held by lay-officers, non-commissioned officers and men in the army, and even by some medical officers) does not actually lead to an increase of syphilis, it certainly does not tend to its diminution (see later, Section 3).

How often one has heard the remark, emanating not only from the private soldier, but even from a non-commissioned officer, 'Whatever they tell you about the "pox," a man's of no use till he has had it'; while a large number regard it not as a disgrace, nor yet as an evil, but as the 'guinea-stamp of manhood,' meaning, I suppose, that one so affected is to be considered a 'man about town,' as 'having knocked about the world'; and when the young recruit on entering the army hears these opinions and expressions from his older comrades, what wonder that he, too, soon falls a victim to temptation in his eagerness to show that he is *bon camarade* and 'knows a thing or two'?

In a former copy of this essay I made a selection for more detailed description of those affections which are most intractable, are most liable to recur, or which have the most deleterious effect upon the health of the soldier. Those selected were—(1) Syphilitic papular eruptions of skin and their modifications in mucous membranes, (2) syphilitic affections of bone, (3) iritis, (4) affections of the nervous system, (5) malignant syphilis. This, however, caused the essay to exceed considerably the length allowed. After prolonged and careful consideration, therefore, I have deemed it advisable to limit my remarks to two forms which are most resistant to treatment, are obscure in pathology, and which receive but very inadequate, if any, mention in the ordinary text-books—namely, syphilitic affections of the nervous system and malignant syphilis.

Syphilis of the Nervous System.—This is such a vast subject, and so important an aspect of the disease, that it will only be possible to make a few remarks of a general nature, and not to treat in any detail of the various nervous affections which may occur in syphilis.

Syphilis affects the nervous system in four ways, which may be called :

1. *Osteotic*—affecting the bones (and membranes sometimes), leading to exostoses and gummatous developments—*e.g.*, exostosis in the region of the internal auditory meatus, causing paralysis of the eighth cranial nerve, or one of the body of the sphenoid, leading to blindness by the invasion of the optic commissure. Epilepsy may be similarly induced by a circumscribed inflammation of the pia mater.

2. *Vascular*—thickening and occlusion from gummatous arteritis leading to thrombosis, with various disturbances, according to the part of the brain supplied, the occlusion leading, as in other cases, to softening and disintegration of brain substance ; but before occlusion becomes total, loss of elasticity in the wall may pave the way to the production of an aneurism.

3. *Syphilomatous*—that is, due to the development of gummata in the neuroglia tissue, for, paradoxical though it may seem, there is no syphilitic affection of nerve tissue ; the nervous symptoms are secondary to syphilis of the supporting connective tissue. The onset and progress of paralysis obviously in these cases will be gradual.

4. *Degenerative*—of a chronic nature—*e.g.*, in general paralysis of the insane and in locomotor ataxy. The association of previous syphilitic history is so frequent that, though not the only cause, nevertheless there must be some causal relation between these diseases. The opinion was formerly very commonly held, and is held by some even to the present day, that all syphilis of the nervous system is tertiary; but this is probably not so, for in some cases the symptoms appear within a year of infection, and occasionally even within six months, being then probably due to vascular lesion.

Some authorities have mentioned, and I myself have noticed the same on more than one occasion, that where the earlier eruptions are rupial in character there seems to be a marked tendency for the disease to attack the nervous system.

The following act, as it were, as predisposing causes, and seem to lead the syphilis to attack that system : (*a*) Sexual excesses (this would, of course, mean a greater risk of contracting syphilis) ; (*b*) excess of alcohol ; (*c*) overexertion, mental or bodily ; (*d*) exposure to cold, wet, or other adverse circumstances.

The effects of syphilis being thus aggravated by these causes, the latter in some cases may so overshadow the true one, syphilis, that the ultimate diagnosis is obscured, and specific treatment delayed in consequence. Also the later stages of the disease seem to be more severe, and the nervous system more likely to be affected where the primary manifestation has been neglected, or the secondaries evident only in slight degree. It must be borne in mind that vigorous early treatment, resulting in slighter manifestations of secondaries, may lead to consequent neglect in treatment at a later stage.

The symptoms of cerebral syphilis may be divided into three main groups :

1. *Sensory.*—Headache is very frequent and often early in onset with the syphilitic fever at the beginning of secondary manifestations ; it is, as a rule, worse at night, sometimes almost unbearable, and accompanied with mental symptoms. One of my patients abroad suffered so much from this that he stole a razor and threatened to commit suicide, and was for a time under observation for mental disease. After trial of the various 'headache remedies' without benefit, mercury speedily gave relief, and, in fact, effected a cure in so far as the patient had no return of headache or mental disturbance up to the time of leaving for England, some months later. In other cases giddiness is also complained of, and the headache persists, though in a less degree, and the patient may have sensations of numbness and formication. Others, again, present a condition of general hyperæsthesia (though this is rare), even a slight touch seeming to cause pain.

2. *Motor*—in various degrees, from slight paresis to actual paralysis. The cranial nerves may be affected by pressure, as the seventh by a syphilitic bony growth at the stylo-mastoid

foramen, or paralysis of the various ocular muscles may lead to squint, diplopia, ptosis, or there may be an extending paralysis from one limb till the whole side is affected, as with gumma of the internal capsule, or a sudden hemiplegia from syphilitic arterial disease with aphasia, if the left side of the brain be the seat of the lesion. Epileptiform convulsions are also by no means infrequent if the cortex be encroached upon, as by a cranial exostosis, or inflammatory thickening of the pia mater.

3. *Psychical.*—Of these, again, there are various stages up to a violent mania, the commonest being loss of power of concentration, general hebetude and slow cerebration, some loss of memory, change of disposition—from cleanly to dirty habits, from thrift to extravagance and waste, from amiability to moroseness and aggressiveness. Sleeplessness is a marked feature in most of these states.

A few peculiarities of symptoms when due to syphilis call for special attention :

1. The aphasia may be intermittent, perhaps due to partial occlusion, followed by restoration of circulation in and recovery of function by Broca's convolution.* It may be sudden if thrombosis occurs rapidly, passing off as the thrombosis disappears, or, again, complete and accompanied by hemiplegia when the internal capsule is involved. In others the aphasia is partial only, consisting in slow, deliberate speech, perhaps due in part to the slow cerebration mentioned above, and not to any definitely located lesion ; or words may be misplaced or mispronounced.

2. The motor symptoms are liable to be very irregular and capricious in development, and may not show the ordinary stereotyped method of spread of other organic disease. Thus one leg may be paretic, and later paraplegia may come on, then some of the muscles of one arm, then the rectum or bladder.

3. Epileptiform convulsions, even if not in themselves severe, are always serious as regards prognosis. They are not so frequently preceded by any definite aura, but by symptoms of more gradual development, such as localized headache becoming more widespread and persistent, or by weakness, bodily or mental, wasting, and so forth. Cerebral syphilitic

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* Marie reports cases of injury to this convolution without the existence of aphasia.

symptoms have much more favourable a prognosis when due to bony lesions than when due to gummata or arterial inflammation; but in nearly every case there are certain residual defects, such as want of sensitiveness, loss of concentration, or perhaps some change in speech, though prognosis generally is better when the condition is the result of syphilis than when due to other organic lesion, because the capability of improvement by specific treatment is more marked.

The subject of syphilis of the nervous system cannot be left without a few words on the spinal affections of the disease. The same manifestations are seen—exostoses, gummata, membrane inflammations. Strange to say, in many cases the more acute the disease, and the earlier in its course the spinal symptoms come on, the less is there to be seen post-mortem; thus in one patient paraplegia came on very rapidly, accompanied by incontinence of urine and fæces, but post-mortem nothing beyond hyperæmia of the cord was discovered. When the onset and progress are slow there are usually quite obvious post-mortem signs present, as gumma or infiltration.

We come now to the last subject of the present section, **malignant syphilis.** In this type of the disease the poison is much more vigorous and the symptoms greatly aggravated. A combination of causes mentioned in an earlier part of this essay (p. 105) appears to contribute to this increased virulence; it would be superfluous to review them again. Though cases occasionally occur in England, this form of disease, which is everywhere becoming rarer, is more often seen in tropical climates. It is difficult, and I think unjustifiable, in the present state of our knowledge to dogmatize as to the cause of the malignancy until more is discovered of the actual cause of syphilis—the habitat, mode of growth, varieties, and general biology of the spirochæte, if the *Spirochæta pallida* prove to be the causative organism. It would be easy to speculate, as some have stated, that the increased virulence is due to some 'specific difference in the germ activity,' or to 'lowering of the opsonic index'; but this serves no purpose, is not an explanation, but merely expresses the same fact in a little more high-flown language. It is true that a man already weakened by excesses, by alcoholic indulgence, by previous illness, by the presence of tuberculosis, is more likely to fall victim to the ravages of syphilis; but examination of a large number of cases and statistics of a still larger number fail to support the theory that there is any direct causative relation therein, and it is well known that of two men infected from the same source, one may have a bad attack, while the other may escape with comparative impunity. In malignant syphilis the symptoms from the onset are severe. One does not see the fairly well-marked division into stages of primary, secondary, and tertiary, for various symptoms supervene one upon another with but little interval; in fact, several manifestations of the disease may be seen at one and the same time. The whole course of the disease is acute, the interval between secondaries and tertiaries being abbreviated till it almost disappears, the two so merging that they may be present in one patient simultaneously.

The manifestations throughout tend to degeneration and greater malignancy, and less to resolution. The primary sore may become phagedænic, the secondary skin affections pustular or ulcerative, and perforation—*e.g.*, of palate—may take place quite early, perhaps within six months. In many cases the eruption early tends to become rupial, and then, as stated above (p. 109), cerebral syphilis seems to follow with greater frequency, and the bones and periosteum very rarely escape. I have myself seen perforation of the palate within six months of infection, but Fournier has reported a case in which within three months cerebral symptoms indicative of a gumma declared themselves.

Rarely, however, do the patients go downhill so rapidly as this, but a common course is for the cutaneous affections to ulcerate within six months, and indications of syphilis in the internal organs to show themselves by twelve months. Again, if a patient does make some improvement under treatment, there seems to be a great liability for the symptoms to recur, and the prognosis is in consequence always unfavourable, and particularly so if the patient is much enfeebled or in bad hygienic surroundings. Specific treatment, too, may have to be delayed from time to time until the patient has improved in general health by the exhibition of tonics, because, if the patient be greatly debilitated, it is sometimes found that mercury and iodide of potassium, instead of ameliorating, will aggravate the condition; then the specific drugs may be administered with advantage.

2. The Influence of Syphilis upon Military Service.

The detrimental results of syphilis from the military aspect will be obvious to all, and are readily proved by statistics, where these can be obtained. As all who have to do with the compiling and interpreting of statistics are well aware, they can be made to prove or disprove almost anything desired, given the requisite manipulatory skill. In order to avoid any such imputation in the present instance, I will merely put forward for consideration the few tables in the Appendix. These, I am sure, require but very little in the way of explanation, as they clearly inculcate their own lessons, and the inferences which may be drawn from them are evident from a short perusal. They have been compiled carefully, and are the result of several months' inquiry and correspondence, and are, therefore, as nearly as it is within my power to make them accurate and reliable. They represent in a graphic manner the curve of venereal disease in its various forms for ten consecutive years in those countries where a fairly large number of British troops are quartered. The relations of these curves to each other are clearly shown. The first series (I.-VII.) shows how widespread are the ravages of these diseases, and how many men are at one time or another, and for various periods of time, ineffective owing to the disease under consideration. Another series (VII.-XIV.) shows, by calculation based to a certain extent upon the first, the number of men who may be regarded, not as temporarily, but constantly and permanently non-effective.

The effect of syphilis upon military service is so intimately connected with the reversed proposition—the effect of military service upon syphilis, the two acting and reacting almost unceasingly upon each other—that they cannot justly be considered apart. One who had merely regarded the subject from a cursory and superficial point of view would be astounded to see how terrible an effect the disease has amongst the army, how extensive is its influence.

The ways in which syphilis and military service react upon each other can be readily understood. In the first place, syphilis is always a very convenient excuse for escaping unwelcome, unpleasant, or arduous duties by 'reporting sick.' A considerable number of men in that way become unreliable when an important movement is contemplated. This makes itself felt more particularly in time of active service, when every available man may be needed. There are always a certain number to be met with in every regiment who have so little spirit that, so long as they escape their own duties and responsibilities, they care not on whose shoulders they fall. These are the men who will never make good soldiers. Not only do they never know their drill and general duties, but they deprive themselves of any chance of learning them by avoiding parade and 'going sick' whenever they feel they would like a rest. A large proportion of these men are 'frequent worshippers at the shrine of Venus, and usually Bacchus, and nearly all have later to worship also at that of Mercury' (Professor Osler). Of course, at times these men are caught out, and punished for neglect of duty, for 'reporting sick' without a cause, and thus the condition leads secondarily to increase of crime.* Such a man, who shows want of control and inability to curb his passions and lower instincts, cannot but become further degraded, morally as well as physically. He becomes untidy in his appearance, careless and slipshod in the performance of his duties, is punished for these, and sinks still further. Physically, also, his constitution deteriorates under the more trying circumstances of tropical climate or active service, and to a greater degree where both are combined. He breaks down, and has to come for treatment—it may be with a relapse of his syphilis, or from some other illness supervening in a constitution which has been weakened by neglect or self-indulgence in some form or other. This it is which makes it so difficult to estimate the deleterious effects of syphilis on military service, for the hardships of the latter may not bring out the syphilis itself, but render the man *hors de combat* temporarily, at all events, through his weakened constitution falling a readier prey to other diseases. The history from the medical aspect of the late Boer War† will probably go far to prove this, and though primary syphilis will be less, since the opportunities for contracting the disease were but few, nevertheless secondary manifestations and relapses of them will, I feel sure, be higher in proportion as the hardships of the campaign came to make themselves felt upon constitutions tainted by disease. A further point, more deeply concealed, which, though highly probable, is nevertheless almost unprovable, is that of estimating the number who succumbed temporarily, if not permanently, to other—intercurrent—diseases which might have been successfully withstood had the constitutions of the victims not deteriorated through their previous excesses and want of self-control.

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* Any charge in the army is designated 'crime.'

† This was written in 1903, before the War Office Report from the medical authorities had been issued.

Though this essay is strictly on syphilis, and all the remarks made above are applicable to that disease, the same apply largely to venereal disease of other forms; for it is to a considerable extent a matter of chance whether the patient contracts the major disease or merely gonorrhœa, soft chancre, etc. (see Section 4 and Appendix). I have stated elsewhere that syphilis and alcoholic indulgence not infrequently go together, but the latter, in fact, may be an indirect though closely connected cause of the former (Section 3, p. 125). This point again, I regret to say, is not capable of proof by ordinary statistics, for the curve of alcoholism does not by any means correspond to that of venereal disease, in particular primary syphilis. If, however, stricter records are kept and notes made (I made such records and notes privately for some months in cases coming under my care) as to the frequency of alcoholic indulgence, the proportion would be seen to correspond much more nearly; for many cases of alcoholic excess do not come under medical treatment, and many even of those that do are not, of course, entered as alcoholism, but under the heading of the supervening disease, such as pneumonia, bronchitis, fracture, syphilis, or that convenient burial-place of diagnosis, debility.

Turning now for a few minutes to look at the other side of the question—the effects of military service on syphilis: It is an undisputed fact that syphilis so undermines the constitution that hardship of any sort is badly borne, and when it comes to more or less arduous campaigning in a tropical climate, the syphilitic is one of the first to break down. His system is unable to sustain the depressing influences of prolonged fatigue, and, instead of being a reliable man, a unit to be counted for good against the enemy, he becomes a drag, an encumbrance, for he requires others to look after him, and is non-effective himself. I have tried, and, though I am thoroughly convinced in my own mind of the fact, I regret to say that I am not in a position to prove satisfactorily by statistics, how in campaigns, or in bad seasons, when the strain upon the individual soldier is heavier than in peace, with ordinary routine duties, there is an increase, and, furthermore, an almost proportional increase, in the number of cases presenting themselves for treatment for secondary syphilis, the primary disease having been contracted previously, and the fatigues and depressing influences of climate and campaign bringing on a relapse of the malady.

It will be advisable now to make a few remarks on the tables in the Appendix, for much information may be gathered from a perusal of these.

The Tables of Syphilis (I.-XIV.).—Almost all of these show a marked diminution during the last three years of observation. The exceptions are: (*a*) An increase in the United Kingdom (Tables I. and VIII.), the main cause being secondary manifestations. It is not at all improbable that this rise may be due to the depressing influences of active service in South Africa. The gradual improvement previous to that is well marked, and was very likely due to better and more thorough education at home. The table showing the ratio of 'constantly sick' (VIII.) is, however, high in comparison even with some foreign stations. This may be because there is not the same need to hurry a man out of hospital as in places abroad with a comparatively small garrison, and treatment is therefore more prolonged. There would doubtless be a great reduction in this respect were the out-patient method of treatment more generally adopted (see Section 4). (*b*) At Gibraltar (VII.) there is an increase in the number of cases of primary disease in 1897-98, and in the last year's observations in India (II.) and China (III.); but the diminution in secondaries more than counterbalances this, so that the total result shows fewer syphilis cases and similar changes in the ratio of constantly sick (IX. and X.). In Ceylon (IV.) in 1897-98 and 1900-01 the reverse of this takes place, the increase in secondary outweighing the diminution in primary, and the proportion of constantly sick is higher (XI.). I have not been able to discover in every case adequate reasons for the increase in the number of admissions for secondary disease, for the length of time those with primary manifestations were under treatment appears to have been about the same as in former years. It cannot with justice, therefore, always be ascribed to insufficient treatment after primary trouble, where the number of troops remains the same; but in other cases—*e.g.*, Ceylon (IV.) in 1894-95—an explanation may be offered, and the tables are also very instructive as indicating the severity of the disease. Thus, in spite of there being a diminution in the number of cases of syphilis, the number of constantly sick is higher, showing (see XI.) that patients require longer treatment, owing, it may be presumed, to greater severity of the disease, since the methods of treatment were similar to those in other years.

The charts for Gibraltar (VII. and XIV.), Egypt (V. and XII.), and Ceylon (IV. and XI.), both for admission and for constantly sick ratios, resemble one another, except that in the case of Gibraltar the acme is delayed until the fifth year, and the fall is on that account more rapid.

One other point remains to be noted—namely, how frequently an increase in primary syphilis in one year is followed by an admission increase in secondary in succeeding years, although the former is diminishing—*e.g.*, Malta 1896-97 (VI.), Gibraltar 1900-01 (VII.), and in the tables for India (II.) and China (III.), where there is an increase in primary ratio, and almost a corresponding and proportional increase in secondary, though in the case of China (III.) the increase is delayed until the second and third years.

In India (II.) there is a marked increase in the first to third years of observation in primary syphilis, with a rapid fall to below the former ratio, whereas in the curve for secondary admissions the fall is more gradual, the effect of the primary increase evidently making itself felt for nearly three years afterwards. Again, a similar effect is shown in the China table (X.), where there is a marked increase in the constantly sick ratio for primary syphilis in the fifth year, followed by a considerable increase in secondary for the two after-coming years. Two explanations may be advanced to account for this—perhaps each plays a part: (*a*) That new troops have been sent to that colony a few months previously, and since no man, so far as is known, is immune to syphilis who has not already been infected, the disease finds a ready field for its ravages; (*b*) that the season has been bad, or disease of other kinds has weakened the system, or the locality is unhealthy, or some such constitutionally depressing influence has been at work, lighting up a partially cured affection, or perhaps the exigencies of active service have resulted in the abeyance of the prolonged treatment necessary to effect a cure.

Tables for Primary Syphilis and Gonorrhœa (XV.-XXI.).—A superficial perusal of this series would seem to warrant the inference that gonorrhœa is, on an average, some three times as frequently contracted by intercourse as is the major disease—in other words, the chances are three to one against the man becoming syphilitic. It is true that, so far as can be ascertained from statistics of the civil population, one prostitute out of every three is syphilitic, while within two, or at most three, years every such woman suffers from some form of venereal affection; nevertheless, I do not think that the other side of the proposition holds good. For it is not an uncommon experience to find the same patient admitted more than once in the course of a year with attacks of gonorrhœa, the history pointing to fresh contractions of the disease, whereas the syphilitic is, at all events for a long time, immune from further infection. If we bear this point in mind, the close similarity between the curves of primary syphilis and gonorrhœa (except that the latter is on a higher plane), as evidenced by these tables, is full of interest, and strongly serves to point out that the man who indulges in promiscuous intercourse runs nearly an equal chance at the second or third time, if not at the first, of contracting the major (syphilis) or minor complaint (gonorrhœa).

Venereal Diseases and Diseases of the Organs of Generation.—When speaking of venereal diseases, non-specific affections have to a certain extent to be taken into account. I have traced the records at three stations as far as I could, and have found by no means infrequently that a case relegated to the latter class, such as ulcer of penis (? nonvenereal), had later been admitted for secondary syphilis, there being till that date no record of the primary lesion in the medical history sheet. By following up as many of these cases as I could collect, I was forced to conclude that nearly 50 per cent. of cases classed as diseases of generative organs were venereal in origin. I do not mean to imply that the diagnosis was wrong in this large number, but that the ulcer, abrasion, or whatever it might be, followed sexual intercourse; though it could not be definitely classed as hard or soft chancre, nevertheless it was venereal in that it resulted from impure connection.

By thus taking in each station 50 per cent. of the number of such cases, and adding them to the total of true venereal disease, specific in origin, the nature of the curve so given remains practically unaltered. This goes some way towards proving that in endeavouring to estimate the mischief of venereal disease in the army, cases admitted from disorders of the organs of generation must in some degree be taken into account.

Tables for Syphilis, Gonorrhœa, and Soft Chancre (XXII.-XXVIII.).—A perusal of this series will show clearly the close similarity there is between the curve of syphilis, gonorrhœa, and that of these same affections, with the addition of cases of soft chancre. The only inference which can justly be drawn from this fact is that the ulcer diagnosed as soft chancre, ulcer of penis, etc. (often stated to be non-venereal) is practically in every case venereal in origin. The plea that the number is so small that the curve is barely, if at all, affected is not tenable, for in some stations there is a large number of such cases, and the curve is on a considerably higher plane. This explanation may hold good for such places as the United Kingdom, Malta, and Ceylon (see XXII., XXV., and XXVII.), but the evidence shown by the tables for Gibraltar (XXVIII.), China (XXIV.), Egypt (XXVI.), and India (XXIII.), demonstrates very clearly the latter view.

At considerable trouble I drew up a series of statistical tables, endeavouring to show to what extent venereal disease depended on indulgence in alcohol. In order to obtain data from which to deduce the curve, I made careful observations by closely questioning all cases admitted to venereal wards under my charge—firstly, as to the habitual indulgence of the patients in alcohol; secondly, as to whether before contracting their present illnesses the patients had been, if not intoxicated, at all events imbibing too freely. I found it useless to take merely cases of alcoholism and compare that curve with those of venereal disease, because, although indulgence in liquor even to the extent of drunkenness is frequent in the army, nevertheless cases entered as ‘alcoholism’ are exceedingly few in number. In some instances I found that quite a high percentage of venereal admissions owed their disease primarily to indulgence in alcohol, the men stating that they 'had had a drop too much,' and did not know what they were doing; but in other instances my view was not so well borne out, for it requires much tact and care to elicit the answers. As soon as the patient discovers that there is any idea of liquor at the root of his complaint, he becomes reticent at once, probably thinking that if he owned up he might be punished, as for alcoholism. This series, as I have already stated, was drawn up on data obtained partly from observations of my own and partly the result of correspondence; but as in many cases the information obtained was worked out from what appeared to me insufficient or unreliable grounds, I have decided to omit these tables, though I do not think that the months spent in obtaining or endeavouring to obtain such data were altogether wasted, since it has served to point out that alcoholic indulgence plays a large part as a predisposing cause of venereal disease, and therefore of syphilis, and that any reforms directed towards the eradication of syphilis from the army must take account also of the intemperance question if they are to stand any chance of success.

The series of general venereal tables (XXIX.-XXXV.) added for each station at which observations could be obtained is compiled from the previous ones, the reasons for doing so being that facility is thereby gained for seeing at a glance to which of the constituent causes the elevation or depression of the general curve for all venereal diseases for the year may be ascribed. Thus, for example, in the general table for Egypt (XXXIII.), between the third and fifth years of observation the total syphilitic curve shows increase followed by diminution, whereas secondary admissions were practically the same during the period, showing, therefore, that the increase and diminution are both due to fluctuation in the number of cases treated for the primary disease. Four years later, in the same table, the reverse is shown—namely, that the total syphilis curve rises, while that for primary falls, the rise being, therefore, due to admissions for secondary disease. Similar instructive deduction is drawn from the table for India (XXX.) in the year 1896-97, where the total curve falls considerably, and the primary curve still more; but that for secondary rises, and practically counterbalances the large fall in primary. In the previous year the curve for total cases rises, while that for primary shows a fall of 2 per cent. This fall is, in the instance under consideration, more than counterbalanced by the rise in number of cases treated for secondary manifestations, the result being a total rise.

If such curves as these were more frequently made and studied, the graphic method would teach a much more lasting lesson, and would aid also in the drawing up of preventive measures. Thus, *e.g.*—taking the last of these instances—having noticed that syphilis cases had increased in number, an incautious observer might cause all sorts of stringent measures to be made, and might perchance get them enforced, for stopping promiscuous intercourse in the station, and would naturally be disappointed to find his method ineffectual. On looking deeper into the state of things, he would see that elevation of the curve was due, not to primary, but to secondary syphilis, and possibly had been caused by an unhealthy season, overwork, manœuvres, campaigning, etc., the men affected already with syphilis breaking down under the increased strain on their constitutions.

Lastly, looking at the general tables, one cannot help noticing the frequent similarity between the curve for syphilis and that for venereal disease, exclusive of syphilis, the only point of difference being that the latter is on a slightly higher plane. This is particularly well shown in the tables for the United Kingdom (XXIX.), Gibraltar (XXXV.), Egypt (XXXIII.), and to a less extent in those for Ceylon (XXXII.), India (XXX.), and China (XXXI.). This adds further support to what has been stated on p. 118.

On looking deeper into the subject, one learns two lessons from a comparison of the curves : Firstly, that the curves agree most nearly in the table for the United Kingdom, where it may be considered the normal conditions of life exist for the British-born soldier. The further we pass from these normal conditions, the greater is the disagreement between the two curves. Secondly, where the discrepancies between the two are greater, another reason is not far to seek. It is this : After an increase in primary cases due to introduction of fresh troops to a district—that is, non-inoculated or uninfected material—the curve for the primary admissions falls, and that for secondary rises, as stated earlier ; but, in addition, although the men have contracted syphilis, nevertheless, when the patients are again up and about after a course of treatment, exposure to venereal disease is again risked, but not to syphilis: the disease contracted now is of some form other than syphilis. So one finds that the rise of the primary syphilis curve, though followed by a fall in that curve, is accompanied by a fall in venereal disease other than syphilis, followed by a rise. This is well seen in the Malta table (XXXIV.) for 1886-89; or a small rise in one is accompanied by a larger rise in the other, and *vice versa*, as in the whole series of years in the Egypt table (XXXIII.); or, thirdly, a fall is accompanied by a more gradual descent, as in the India table (XXX.). It follows from this, and from what has been stated already (p. 118), that the curve for venereal disease, excluding syphilis, should correspond more closely to that for secondary admissions than to that of either the primary or total cases, and this is found on examination of the tables to be the case, as in India, the United Kingdom, the first seven years of the China table (the last three being explicable by the opposition between the primary and secondary cases), Gibraltar (less easily seen, because the curves are so widely separated), and in Ceylon (1894-1900).

An essay many times the length of the present might be written upon these tables alone, but more space cannot be spared for the purpose here. The lessons taught by them, the inferences which may be drawn from them, the preventive measures which may be based upon them, have been merely indicated. The last point will receive more detailed consideration in the final section, treating of the prophylaxis of the disease.

3. The Causes of Syphilis in the Army.

Since the subject to be treated in this section covers a good deal of ground, some systematic method of description is necessary to avoid omissions. With this end in view, the causes will be divided into two main groups: (1) predisposing, (2) direct; and when speaking of the former of these, three further subdivisions will be made: (*a*) the soldier himself, (*b*) his surroundings, (*c*) other extraneous causes; while under the heading of direct causes will be given a description of the ways by which the contagion may be conveyed in the case of a soldier.

(1) **The Soldier himself as a Predisposing Cause**—(*a*) *Age.*—The age at which the majority of recruits enlist is that of

early manhood. The sense of personal restraint has been practically cast aside, the man rejoicing in his new freedom, and the feeling that he is his own master, with a good deal of spare time on his hands; and although he has to conform to the disciplinary rules of those superior and senior to himself, nevertheless, apart from this, personal discipline and moral self-training have little or no part. Continence to one of such an age, in vigour of full virility, brought up as the majority of recruits have been, is a severe restraint, harder from the diversity of Nature for one man than for another, and the barrier of reserve soon gives way.

As regards the other side of the question—the effect of the age of the man upon syphilis—there is not much to be said; but undoubtedly after a man has passed the prime of life, the later the disease is contracted, as a rule, so more severe is the attack. Thus, in a patient of thirty-five to forty years contracting syphilis for the first time the disease will probably be severe, the lesions more grave, and the likelihood of recovery more remote. Incubation is short, the earlier symptoms may succeed one another in more rapid sequence, the eruptions tend to become pustular, tertiary signs appear early, gummata may be evidenced within a year; in short, the type in such subjects approaches that known as malignant syphilis.

(*b*) *Class of Men Enlisting.*—It must be understood that the remarks throughout this essay are to be taken as applying to the majority of soldiers. Among recruits there may be—nay, there doubtless are—men of much higher stamp, socially, morally, and intellectually, than the rest among whom their lot is cast: of them I do not speak. The general run of men enlisting are of a class which has hitherto had to work for their living, and work hard. Their spare time has been very limited, the work probably arduous manual labour, which has left them tired out by the end of the day, and only too ready, partly from fatigue, partly to save expense of fuel and light, to seek bed early, so that they may be able to rise correspondingly early to begin the duties of another day. Such men have no time for self-improvement and self-education, or, at all events, do not take advantage of it, owing to the opportunities being few and far between, or to the fact that self-education is not called for by their work, but tends rather to make a man unpopular among his fellow-workmen ; so when he is fortunate enough to get a day's holiday, he allows his lower nature to have free play : rough skylarking, plenty of alcohol and tobacco, general self-indulgence—these are his methods of enjoyment, his way of showing that he is 'off duty,' and superior to his ordinary circumstances. So, after enlisting, plenty of free time means plenty of opportunity for pleasure, for the canteen, for smoking, for contracting venereal disease, though there is this to be said concerning the latter—that through ignorance such men are to a certain extent unaware of the enormity of the risk they run by connection with the women of the class whose society they frequent.

(*c*) *Uncleanliness.*—Very few of the poorer classes from which the majority of recruits are taken are able to indulge in the luxury of regular baths. This is not from love of dirt, but simply because few possess baths of their own, and a visit to public ones entails more expense than they can conveniently afford. Consequently, the general health to some extent must suffer, and the body becomes all the more a ready prey to disease. From general personal cleanliness to the more local is but a small step—in fact, the latter is included in the former, and on inquiry it is found that few, if any, of the soldiers who contract syphilis make any attempt to wash themselves after connection, the nature of which is more likely to be an impure and infective one than the reverse. Hence any abrasion which may be the receptacle of the virus is left uncleaned, untouched; the virus develops, and the abrasion becomes the seat of a typical chancre. Also the neglected condition of the parts, the retention of smegma, leads to irritation and desire for connection, personal uncleanliness in this way becoming a predisposing cause of syphilis.

(2) **The Environment of the Soldier.**—One of the most powerful predisposing causes of syphilis is the nature of the soldier's surroundings, his barrack companions. Amongst these he finds many lawless spirits, men popular for their general good-fellowship, but who do not look upon syphilis with an eye of aversion and horror, nor upon the contraction of it with any sense of shame (see p. 107). The young and foolish lately-joined recruit looks up to these men as his barrack-room heroes, and feels that he himself is regarded as of little account, as being yet a boy, until he has at least

exposed himself to venereal disease; and if he can show by being admitted to hospital that he has 'won his spurs,' then in his poor imagination he feels that he is indeed a man of the world, and bears upon him the unmistakable seal and the guinea-stamp of manhood. Whether the disease be syphilis, gonorrhœa, or venereal sore is largely a matter of chance (see Section 2, p. 118). Having before him such poor examples morally in some of the non-commissioned officers and senior privates, and having, as a rule, so little education, moral or otherwise, to point out to him the follies of yielding to the chaff and taunts of his seniors, the temptation soon gets the better of him, and he gives way, with the usual result.

Alcohol, again, is not only an important predisposing cause, but has considerable influence upon the course and character of the disease. Spending a good deal of his spare time in the canteen, his passions are inflamed by filthy stories, by the excess of liquor in which the soldier indulges; his better judgment and self-control are speedily robbed of their power, restraint is no longer attempted, and in a weak moment he falls. If he escapes the disease the first time, familiarity will probably soon breed contempt; he is less careful the next, till finally no precautions are taken at all. The history given in many cases is: 'I had a drop too much, and did not know what I was doing' (see p. 120).

Looking again at the reverse aspect of the question—the effect of alcohol upon syphilis—we find that, owing to the general lowering of the system in chronic alcoholics, the attack is nearly always a severe one, all symptoms being aggravated. Any weakening influence—excess, exposure, etc.—has a like effect, but without doubt alcohol is the commonest. Particularly is its baneful effect noticeable in syphilis of the nervous system. If the patient has been previously a heavy drinker, and still more if he continues the habit after he has contracted the disease, the prognosis becomes much more serious, and the hope of ultimate complete cure can almost be set aside. Who has not heard the oft-quoted aphorism, 'Syphilis is best preserved by alcohol'? If the alcohol has already affected the kidneys, the course of syphilis is usually severe and rapid. The reason of this in all probability is that, in order to satisfactorily get rid of the poison, the general state of health of the body and the functions of its systems and organs must be of as high a standard as possible, and anything which tends to lower this standard, such as excess of any kind, retards the elimination of toxic substances.

A good deal has been written as to the effect of *climate* upon syphilis, but probably climate *per se* has very little influence one way or the other. The disease is found in every district to which civilization penetrates. As far as general experience goes, in equable and temperate climates one rarely meets with the very severe forms which are sometimes seen in tropical countries, but this appears to be due to the fact that other constitutionally depressing causes are not acting. Residence in a tropical climate, especially in the case of those brought from temperate zones (such as our own soldiers), certainly tends to lower the general tone, and diminish to some extent the natural power of resistance to disease, and hence in some degree is explained the more widespread ravages of syphilis in tropical countries.

We now come to the consideration of the third group of predisposing causes. Of these there are several—some are very obvious, others act in some subtle way and rarely act singly.

(*a*) *Free Time.*—To one who suddenly changes the continuous and fatiguing duties of a labourer's or artisan's life for those of a soldier (more particularly under the new regulations),* as soon as the sense of novelty becomes dulled, the time when off duty begins to weigh heavily. There are several hours during the day in which the newly enlisted soldier has no employment, and when the evening sets in there comes with it the desire for relaxation, for entertainment, for something more exciting than the monotonous routine of a soldier's duties. In his former life his daily work brought fatigue, and he was only too ready for his night's rest ; moreover, he was obliged to keep himself in a good state of health, or he would lose his pay, and perhaps his situation. In his new condition he has no such cares ; he is housed, clothed, and fed, whether in good health or bad, and soon finds out that men in the latter state are better housed and better fed than in the former, and also escape military duties, which are perhaps becoming irksome. One does not mean to imply that a man wilfully contracts syphilis, but at the same time the soldier feels that, should he be so unfortunate, it will make but little difference to him personally, and that the difference is, if anything, a change for the better. Unless the 'out-patient' method of treatment is adopted (see p. 144), his contraction of the disease probably means a good spell of hospital, with better dieting than barrack food, with rest from military duties, while later manifestations give ample opportunities for 'reporting sick' whenever he gets into trouble or unpleasant duties have to be performed.

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* This was written in 1904, when the regulations for recruits were very lenient, and, so far as I am aware, they have not since then been made more stringent.

(*b*) *Want of Occupation.*—It is not the free time alone that leads to the mischief; it is the fact that this time is almost totally unprovided for. There are too many men off duty together, and consequently too much noise in the barrack-room, for even the few exceptions who are so minded to do much in the way of reading and self-education; and except on occasional evenings, when entertainments of some sort are got up by a few zealots in the cause, there is a great want of healthy occupation for spare time. The Army Temperance Association is doing good work in this direction, but by failing to distinguish between temperance and total abstinence, and so by the exclusion of all who are not abstainers or members of the A.T.A., it makes a great mistake; for it is just those who would probably benefit by being kept away from unhealthy indulgences who are precluded, in many places at least, from joining in or even attending the entertainments got up by the members.

(*c*) *Venereal Disease no bar to Advancement.*—The private sees that the fact of having contracted venereal disease seems in no way to interfere with his success in the service, unless, as is, of course, not infrequently the case, he become also slovenly in habits and slipshod in his work. He sees men who he knows have suffered repeatedly from gonorrhœa, soft sore, or other venereal disease, later promoted to be non-commissioned officers, and he sees others who do not abate their practices one iota after being so promoted, and that being so, from his narrow point of view he merely says: 'It only affects me whether I am ill or not; it does not interfere with my career in the army. What business is it of anyone else whether I get venereal disease or not?'

If his seniors, non-commissioned officers or privates, set him such an example, he cannot see why he should not be equally fortunate if he follows in their footsteps and indulges in similar habits.

(*d*) *Lenient View of Officers.*—Finally, but far from least—for I regard the following as one of the most potent of predisposing causes of syphilis in the army—I must speak of the negligent, nonchalant view in which the disease is regarded by those who should know, and do know, better. One can understand the private soldier, brought up more or less in ignorance of the suffering caused by syphilis, of the enormous risk that is run by promiscuous intercourse, with little education and not much moral courage and backbone—we can excuse to some extent such a man looking with a lenient eye upon syphilis, but what of his officers ? I have spoken to many officers upon this subject, and they refuse to believe that syphilis causes such ravages as it actually does cause ; they look upon the man who contracts the disease with a certain amount of pity, as an unfortunate one of whom a mean advantage has been taken for obeying, as they express it, 'one of the laws of Nature.' Numbers of medical officers seem to take the same view. It is vastly more culpable a view in their case, for many regimental officers have passed straight from school to the academy with merely the mixed knowledge of the schoolboy and the crammer, and thence into the army ; but medical officers have had ample opportunity of studying the disease in all its aspects, and yet they, too, regard it often as merely 'a piece of bad luck.' If we examine a large number of invaliding papers, Army Form B. 179, and turn to Question 12,* almost invariably one sees the reply 'No,' or 'Has not been aggravated by intemperance, vice, or misconduct.' If we now look at the same patient's medical history sheets, we may find two or three admissions for gonorrhœa, one for primary syphilis, perhaps two or three more for secondary syphilis. The man may perchance be invalided for the effects of syphilis itself, and yet the answer be stated 'No,' whereas syphilis and other venereal diseases contradict the negative in each of the three. Impurity and illicit connection is a vice, is intemperance, is misconduct. A man who renders himself incapable of performing his duties through alcoholic excess does not get off scot-free ; why should a man escape with impunity who renders himself ineffective for a longer period owing to sexual intemperance ? Syphilis ought not to be regarded as a misfortune. Every time a man seeks such intercourse he courts a risk of contraction of syphilis ; he does the act with eyes open, and should, therefore, rather be congratulated on a remarkable piece of good fortune if he escapes, than commiserated when his act meets with the penalty it deserves.

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* The question referred to is, 'Has the patient's condition been aggravated by intemperance, vice, or misconduct ?'

The final subject with which this section will deal is that of the modes in which contagion of syphilis may be conveyed. Hereditary transmission will not be taken into consideration, because such cases will have evidenced themselves before the age at which the man attempts to enlist, and he will have been rejected. If any happen to leak through into the army, their number is so small that they may practically be disregarded.

(1) **Direct Conveyance of Contagion**—(*a*) *By Sexual Intercourse.*—A study of available statistics shows the proportion of all cases so affected amongst the civil population as 90 per cent., or a little over ; in the case of the army the proportion is higher : the statistics obtained from various hospitals work out at 98 to 100 per cent. Probably there is some slight abrasion of skin or mucous membrane by means of which the virus enters and at this site develops.

(*b*) *By Kissing.*—A syphilitic subject cannot convey the disease in this way unless she be suffering from specific affection of mouth or throat. Ordinary physiological secretions in a syphilitic, and even pathological, unless the disease be actually connected with the specific process, do not appear to convey contagion ; but if the saliva contain the débris of some syphilitic ulceration or other specific pathological process, then the disease is conveyed, though it would seem that there would probably have to be some crack or abrasion in which the virus is received. Any part of the face, if such an abrasion be present, may be the seat of a hard chancre.

(*c*) *On Hands and Fingers*, occasionally by accident. I have seen one man contract the disease by having in a fight struck another on the mouth, the teeth of the latter wounding the knuckles of the former, and the gums bleeding, or the mouth containing débris of specific lesion ; infection occurred, and a typical chancre appeared. In another instance which I met with in civil practice, but which might equally occur amongst soldiers, a man while carpentering cut his hand with a chisel; to stop the bleeding he wrapped tightly round it a piece of rag which he found lying—providentially, as he thought—upon the ground. This rag turned out to be one which had been thrown away after being used to dress a syphilitic ulcer. A typical chancre supervened, followed by secondaries. A more usual source of infection of fingers amongst soldiers arises from improper practices.

(2) **Indirect Conveyance.**—There are several modes of indirect conveyance of the virus of syphilis, but the great majority arise from the mucous membrane of the mouth, or discharges mingled with débris of specific pathological process in mouth or throat. When one sees how frequently soldiers share their belongings, one cannot help a feeling of surprise that cases of indirect infection are not still more common. Thus, drinking-mugs are frequently passed from one to another, and given a syphilitic condition of the mouth of the first and a small microscopic crack on the lip of the second, every facility for infection is present. Pipes, again, are fairly generally held as common property among barrack friends, and I know for a fact that even tooth-brushes are so regarded. Forks and knives, too, if not jealously guarded, are appropriated by the first comer. A soldier often eats with his knife, and cleaning of either fork or knife is to him quite superfluous, unless an inspection is impending.

One of the worst cases I have met with in the army arose from a man picking up a cigarette-end which had been thrown on the floor of the barrack-room by a comrade, and smoking it. A hard chancre developed just inside the lower lip, with secondary manifestations in due course, which necessitated prolonged treatment. The man showed no signs whatever of having had venereal disease, and was greatly upset at the suspicion which naturally attached itself to his complaint.

Another possible method, though I have never seen an illustrative case, may arise from the habit common amongst boxers of filling the mouth with water, and ejecting it over the unfortunate principal in the intervals between the rounds. Should the second chance to have any specific ulceration in the mouth, the virus might easily be conveyed to an abrasion in the face of the combatant.

Another way in which infection is by no means unlikely to occur is that of tattooing. Among some soldiers this is greatly in vogue. They can rarely afford to go to the higher class operators, and in one case at least of which I have heard, although not under my own charge, the tattooer used his saliva for moistening his pigments, and also placed his needles in his mouth, and by this means inoculated the patient.

Again, soldiers not uncommonly sleep in each other's blankets, and borrow one another's shirts. Should either man have a discharging specific ulcer or a pustular eruption, it is by no means impossible for the other to become infected at some scratch or other which may be present. I have known erysipelas to be caught by sleeping in the blankets of another man who had 'reported sick' with what turned out to be that disease.

The last methods of infection of which I intend to speak may be grouped together under the head of 'surgical syphilis.' This ought never to occur, but since it may possibly do so it is advisable to say a few words on the subject. If surgical instruments are not properly sterilized after use a great risk is necessarily run by the next patient requiring them. The instruments most likely to be the cause of such an unfortunate occurrence are dental forceps, for one not infrequently sees the instruments dipped in carbolic acid (1 in 20), or even in weak Condy's Fluid after one extraction, and then almost immediately applied on another patient. This is a great mistake often made with regard to antiseptics—that a momentary immersion destroys all pathogenic organisms, and that a transitory dipping renders hands and instruments 'clean every whit.'

Spatulas, Eustachian catheters, etc., might similarly act as a means of transfer of the disease.

There are two operations which must be particularized as being more likely than others to convey syphilis—namely, skin-grafting, without making full preliminary inquiry to decide that the giver is not syphilitic; and, secondly, vaccination. Though invaccinated syphilis has undoubtedly occurred it is now probably merely a horror of the uneducated serving to bolster up a fancied 'conscientious objection.' In the older days of arm-to-arm vaccination, when the whole operation was not infrequently carried out in a slipshod manner with unclean (surgically unclean) instruments, it was certainly more likely to arise; but to one who has followed the course of argument, and the experiments made upon himself, with such lamentable results, by my old teacher, the late Dr. Robert Cory, the probability of contraction of syphilis by vaccination was always small, and under modern methods almost impossible.

Distinction must, of course, be made between invaccinated syphilis and a vaccinated man who contracts the disease in the wound, as, *e.g.*, by dressing it with an infected rag (*vide* p. 130). It must be remembered also that if several be vaccinated with lymph from the same syphilitic subject, all may not become syphilitic, nor may all the marks be affected in one who does contract it. The reason of this, as shown by Dr. Cory, is probably that the virus is not contained in the lymph itself, but in the blood or pustular eruption of a syphilitic subject, and therefore, if the lymph be taken carefully and no blood be drawn, and if none be taken from any vesicle becoming pustular, syphilis will not be communicated. In another way infection may occur—namely, when a vesicle in a healthy subject is used as a source of lymph, but an infected lancet is employed for its extraction. Again, if points be used instead of tubes, the moistening among careless doctors and among poorer classes may be done by the saliva, which may itself be infective. None of the last-named methods of conveying the disease are likely to occur at the present day except under exceptional circumstances, such as, for example, in outlying stations abroad in the case of a small-pox scare, when an adequate supply of fresh calf lymph might not be available in time, necessitating the resort to arm-to-arm vaccination.

One final way in which the disease may arise in connection with vaccination, though not due immediately to it. Several, particularly of the poorer classes, object to vaccination, and in order to prevent the inoculation taking effect, a friend may be prevailed upon to try and remove the lymph by sucking, and the disease be thus conveyed, and reported later by rabid antivaccinators with great triumph as 'invaccinated syphilis.'

All these dangers would be obviated by paying attention to the following precautions. We somewhat anticipate the next section in mentioning them here, but in speaking of treatment the limited extent of this essay will only permit general principles to be dealt with, and we shall not then be able to particularize.

1. Always use calf lymph when possible, and so avoid any risk from human lymph and arm-to-arm vaccination.

2. If it be necessary to use human lymph through inability to obtain any other, see that the subject from whom it is taken shows no trace of syphilis.
3. Be careful, if human lymph is used, to draw no blood from the vesicles.
4. Use normal vesicles only; never attempt to get lymph from any which are becoming pustular.
5. If points be used, moisten with water, preferably sterilized.
6. Vaccinate only one patient's arm at a time, not going from arm to arm, also sterilize the lancet after each vaccination.
7. Wait till the lymph has quite dried before leaving the patient, and before allowing him to unroll his shirt-sleeve. If already dried in, no amount of sucking will remove the lymph or stop its effect.

4. The Treatment of Syphilis in the Army.*

In the treatment of syphilis it is more important than in the case of almost any other disease to bear in mind that the disappearance of a symptom does not mean the cure of a complaint. When a man presents himself with a chancre, a condyloma, a secondary rash, or any other manifestation, it is our duty to remember, and to so impress it upon the patient that he remembers also, that, though the primary sore may be healed, the rash disappear, nevertheless the syphilitic virus introduced into his system is yet far from being eradicated. Treatment must be continued for a long period, wearisome though it be, whether fresh manifestations present themselves or not. It is in this endeavour to impress upon our patient the necessity for prolonged submission to treatment that our main difficulty lies. The chancre may be a small one—it is readily cured in nearly every case ; the secondaries may be very slight, almost evanescent ; the patient soon states that he feels quite well again, and wishes to return to duty. He is told that if he leaves hospital he must none the less continue to take his medicine. The promise is readily given, the patient goes out, and perhaps keeps his promise for a few weeks, more likely for a few days only, then slackens off, and becomes irregular, and finally stops taking his medicine altogether, many months too soon. As things are at present, there is every facility for this. I venture to suggest that the following regulation should be brought into force and rigidly adhered to : Every patient who shows signs of syphilis should be treated medicinally for eighteen months to two years (under observation for that length of time, not necessarily with continuous administration of drugs), either as an out-patient from the beginning, or, judging each case on its merits, as an in-patient for the commencement and first two or three weeks of treatment, and readmitted later if untoward symptoms arise. Whatever method is adopted—inunction, intramuscular injection, etc.—the treatment must be persisted in. A list should be kept of all patients under treatment, noting the length of time they have been so ; and if a man leaves the station before completion, notice should be sent to his new station, giving the particulars of his treatment up to date, with results, so that the medical officer to whose care he passes may have some guidance as to what course to pursue, and for what length of time.*

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* Most of my early ideas on the subject of syphilis were obtained several years ago by study of Mr. Alfred Cooper's work on this disease. Before starting to collect notes for this essay, I again carefully studied a later edition of his book, written with the assistance of Mr. Cotterell. It is difficult, therefore, for me to estimate and adequately express my indebtedness to that work, especially in this section; and since, when writing this essay, I was abroad, and no longer had a copy of Mr. Cooper's work, but only my notes to go by, I am unable to state definitely text and verse in those places where I have made quotations; and although the conclusions drawn from the use of many of the preparations mentioned in this section are based on my own experience, I was led to make trial of them by following suggestions given in that work.

As stated earlier in this essay, it is out of the question in the limited space at disposal to treat in detail of the various manifestations of the disease. The following method will, therefore, be adopted, in order that my views may be given as concisely as possible, omitting, I hope, nothing that is important, while at the same time admitting nothing that is irrelevant to the subject under discussion :

A. The treatment of syphilis in general : (1) hygienic, regiminal, and dietetic ; (2) medicinal.

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* Since the above was written this has been done, and regular ‘ Syphilis Case Sheets,’ containing most, if not all, of these points, are kept at the station where the man is serving, and forwarded to any new station to which the man may happen to be transferred.

B. The treatment of special manifestations of syphilis calling for particular notice, but not previously mentioned.

1. **Hygienic and Regiminal.**—This is a very important part of the treatment, and should be considered every bit as necessary as the medicinal treatment itself. It has been stated (probably with truth if the conditions were carried out) that a patient who observed well all the ordinary rules of hygiene, but took no medicine, would stand a better chance of recovery—at all events, would make greater improvement—than another who might be taking large doses of antisyphilitic drugs, but who, by self-indulgence in alcohol, by other excess, or by exposure, contravened all the ordinary rules of health. Personal hygiene is, of course, included. If the man is young, leads a fairly active life, and is in a good state of health generally, proper treatment will in almost every case result in perfect cure. If, however, he has previously undermined his constitution by indulgence or excess, or suffers from any debilitating disease, especially tubercle, the prognosis becomes less favourable according to the degree of this debility. Therefore, if a tubercular patient contracts syphilis, the former disease must also receive due attention—in fact, at the commencement of treatment our major efforts may have to be directed to it rather than to the syphilis; for if the tubercle be active, the syphilis is nearly always severe, and the system is greatly drained. If antisyphilitic drugs be given while the patient is in this state, the disease will not show any marked improvement, but, on the contrary, the patient's general condition may get worse. If, however, tonics be given, general hygiene be attended to, and if the tubercular condition can be arrested or even delayed, rapid amelioration will probably follow specific treatment (see also later).

In other diseases affecting the general constitution, such as diabetes mellitus or Bright's disease, the contraction of syphilis must be regarded very gravely. Therefore, throughout treatment we must see that the patient's surroundings are healthy. If he is not taken into hospital, it would, I think, be well to have a barrack-room set apart, or tents where each might have more cubic space, approaching more nearly to that of hospital, with plenty of fresh air and good lighting; or, if the station is an unhealthy one, let the patient be sent to some other, and temporarily attached there for duty. Many cases are better when treated as out-patients, for the exercise and routine duties would maintain the physical condition at a higher standard than if the men were merely loafing about hospital. Moderately early rising, correspondingly early bed, carefully regulated exercise, and supervision of the general mode of life, all help enormously in bringing about successful results—in fact, they form the basis on which success in treatment is founded, and without which all the drugs in the world may fail.

Very intimately connected with the above is the careful regulation of diet and habits of the patient undergoing treatment. The question of habits has been largely dealt with in the foregoing. From what has been said, it will be readily understood that indulgence in alcohol must be avoided—in fact, it is better to prohibit its use altogether, except when required as medicine, as a tonic, or as an aid to digestion. The aphorism that 'Syphilis is best preserved by alcohol' has already been mentioned and commented upon. All excess and dissipation are similarly injurious proportionately to their harmful effects upon the patient's general state of health. He should have plenty of fresh air, and should therefore take sufficient exercise to ensure this, but not to the extent of producing actual fatigue. If he does not feel refreshed by an hour to two hours' rest after exercise, it may be taken as a fair working standard that the exertion has been too severe. A cold bath, or even a short swim, if possible, will help to brace up and invigorate the functions of the body, and keep the general condition in good trim, care, of course, being taken to avoid chills. Clothing should be regulated according to climate and season, so that a moderate and fairly equable temperature is maintained. On the subject of diet very few words are necessary. The food should be nourishing, easily digested, and should contain vegetables, but alcohol only as stated above. If a patient suffers from dyspepsia, the whole system will suffer in consequence : the man will become depressed, will lose faith, will not so readily keep to the routine of his treatment, and improvement will cease.

2. **Medicinal.**—The medicinal treatment of syphilis may be resolved into the detailed discussion of two remedies—mercury and iodine (usually as iodide of potassium). Some authorities of note refuse to recognize the latter of these as necessary for the cure of the syphilis itself. They hold that the micro-organism of the disease is destroyed by the former drug,

mercury, and that the iodide comes into play 'as a scavenger to clear away the débris.'* Certainly there is a good deal to be said in favour of this view, perhaps the chief argument being that mercury is found to be ineffectual in the tertiary, the gummatous, stage, whereas the iodide brings about marvellous results, and in this stage it is usually considered that the micro-organism is dead, or at any rate non-infective. This would account for the success of the iodide and the failure of mercury in these cases. It would appear from some experiments carried out at the Brown Institution that mercury may have some power of arresting diseases which depend upon an 'organismal virus,' for if a dose of anthrax be administered to an animal under the influence of mercury, which would have proved fatal to an unprotected animal, the subject is found to be unaffected by the poison.

Other remedies, to which recourse must be had for those who are unable to take mercury, will be dealt with later.

Mercury.—The various ways in which this drug may be administered will be considered, and opinions given from experience as to which manifestations of the disease are best benefited by each.

(1) *By the Mouth.*—There are several preparations of mercury from which selection may be made for administration in this way. A very convenient method is to give the ordinary blue pill, in doses of 3 to 5 grains twice daily, at morning and bedtime. This may give rise to some looseness of the bowels. If actual diarrhœa is induced (for moderately free action is not a contra-indication to continuance), a small dose of opium ($\frac{1}{4}$ to $\frac{1}{2}$ grain) may be advantageously combined with it; though, if possible, this should be avoided—for two reasons: firstly, in case the opium habit is established; and, secondly, because it interferes with proper elimination by the kidneys. In a variable time, but probably within two or three weeks, there may be noticed the first faint indications of the gums becoming affected. The dose should then be reduced to one-half, or the pill given once a day only. Salivation must be avoided, because if this occurs, the administration of the drug must cease for a time, and at this early stage of treatment cessation gives the disease another opportunity of gaining the upper hand. Apart from this, affection of the gums is injurious, and renders the patient unable to take his food,

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* De Méric, 'Syphilis and other Venereal Diseases.'

and lowers the general well-being, which must be maintained at as high a standard as possible.

If the patient can be prevailed upon to submit, the course of treatment should extend over eighteen months to two years, as before stated, and the following division of the period is the one I venture to recommend : The mercury should be given for the first six months (provided always that salivation is not induced), then stopped for four to six weeks ; after this again continued for three months, stopped again for a little longer period than before (say two months), again given for three, stopped for four, and finally given for another three months, or, using smaller doses during all the latter part of the last period, continued till the two years are up—*i.e.*, making the last term of reduced doses up to five or six months ; or some milder preparation, such as hydrarg. cum creta, may be given instead. It is advisable both on theoretical and practical grounds to end by a two to three months' treatment with iodide of potassium.

If the purgative effect of pil. hydrarg. rapidly shows itself, some other preparation of mercury must be chosen. One of the best, if not actually the best, but which, however, is not at present kept in army hospitals, is the *tannate of mercury*. I have had opportunities of trying this drug in private practice, and have in most cases found it answer very well, since it does not give rise to either diarrhœa or colic. A dose of 1½ to 2 grains is, as a rule, sufficient. If, however, this cannot be obtained, grey powder in doses of 2 to 3 grains may be given twice daily, or in some cases, where more rapid influence is desired, thrice a day, combined, if demanded by the diarrhœa and colic, with 2 grains of pulv. ipecac. co. On account of the opium, this last should only be given to tide over a short time, and is, therefore, serviceable towards the end of a course of mercury treatment.

Calomel is not a good preparation for internal medication, unless the rapidly induced influence of mercury is desired. It too will probably need to be combined with opium. It is useful externally as a dusting-powder for condylomata, especially anal, and for the primary sore if it be moist and give off more discharge than usual.

Corrosive sublimate is a favourite form, partly because it allows of ready dilution to a small dose (for which reason it is said to have been originally introduced by Van Swieten towards the end of the eighteenth century*), and partly because it is absorbed without undergoing chemical change in the stomach. Some give comparatively large doses of this drug, but that does not seem necessary, and is liable to cause purging and colic, whereas a dose of $\frac{1}{20}$ to $\frac{1}{12}$ grain given twice or perhaps three times a day is usually quite effectual. If a solution of the perchloride in water be employed, it should be kept in dark bottles, or away from direct light ; if not, chemical decomposition takes place, the subchloride being precipitated and hydrochloric acid liberated. This action is checked by the presence of alkaline chlorides.

Mercurous iodide is employed by some, but, I venture to think, on a mistaken idea of its action. As stated earlier in this section, mercury is regarded as the germicidal element, and iodine as the scavenger to remove the syphilitic products ; therefore it is better to give the drugs separately, and let the iodine do its work when the mercury has performed its share ; otherwise, although the result may be favourable, we are in the unfortunate position of not knowing to which drug (or to which part of the compound in the case of the iodides) to ascribe the benefit, and are therefore unable to increase our knowledge from its use. Nor will it help us, except empirically, in future cases. It is given in doses of $\frac{1}{4}$ to 1 grain. It is somewhat unstable, and liable to decompose if given with organic substances. Mercurous iodide is found to be more effectual in the later secondary manifestations, the reason probably being that it is the iodine in the drug having most effect.

The Biniodide of Mercury.—This also is found to give better results in the late secondaries (as arteritis, syphilitic affections of the nervous system), and in the gummatous stage, due, in all likelihood, to the proportionately larger amount of iodine contained. It is an unstable compound, but keeps better if dissolved in a solution of potassium iodide. The following formula is a useful one, the patient taking $\frac{1}{16}$ grain of the biniodide in each dose :

℞	Hydrarg. perchlor.	gr. i.
	Pot. iod.	gr. xxx.
	Glycerini	ʒii.
	Aquam	ad ℥viii.

Sig. : ℥ss. ter die.

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* Cooper, 'Syphilis,' second edition, p. 447.

For my own part, in the later stages, if mercury and iodine are both required, I think it better to prescribe the latter in the form of iodide of potassium and the former by inunction. The green iodide for a short time came into fashion. I have never personally tried it, but think it would be somewhat disappointing in giving variable results, since it is a compound unreliable as regards the amount of iodide present. It is a mixture in varying quantities of iodide and oxide.

The many fancy preparations of mercury which have been brought into the market from time to time I have not described, such as aluminate, asparaginate, cacodylate, etc., for they have not been sufficiently tried to show any superiority over the ordinary preparations. They are more difficult to obtain, and in military work it is better to keep to the few forms whose utility is undoubted than to hamper the equipment with numerous compounds of the same essential—mercury. Moreover, many of these preparations are but the flotsam and jetsam of American and German firms which have come in on one tide, and probably will go out with the next.

All the time a patient is taking mercury careful supervision of mouth hygiene should be carried out. Stumps should be removed, carious teeth stopped or extracted, and the tartar which gathers on the teeth should be from time to time removed. If salivation does come on, the mercury must be stopped at once, an active purgative given, the mouth kept clean by using a soft brush at least twice a day, and a gargle and mouth-wash of a stimulating and astringent nature prescribed, such as the following, to be used every three hours :

℞	Alum. sulph. Pot. chlorat.	āā ʒii.ss.
	Aquam	ad Oi.

If there is much fœtor of breath and débris of ulcers in the mouth, a solution (B.P. strength) of chlorinated soda rapidly cleans up the cavity. It should be added in the proportion of 2½ ounces to each pint of the above gargle. ' If the salivation is very troublesome, atropine may be required : $\frac{1}{300}$ grain of the sulphate should be given every four hours by the mouth. After the trouble has disappeared a short interval should be allowed to elapse before the mercury is renewed, and then very cautiously at first in small doses.'

There are a few general regiminal rules (see Cooper, 'Syphilis,' p. 446) which it is advisable to enforce during mercurial treatment. They will be mentioned here once and for all, to avoid needless repetition :

(*a*) If there is any fever or condition liable to be aggravated by exposure to the air, such as iritis or laryngitis, it is better for a time to confine the patient to bed.

(*b*) During the actively eruptive stage the patient need not be kept in bed, but he should not leave the ward.

(*c*) In the earlier stages, and if neither of the above contra-indications be present, open air and exercise in moderation seem to ward off salivation.

(*d*) The diet should be light, plain, but nutritious (see earlier) ; and when the patient leaves hospital and is allowed to attend as an out-patient, he should be warned to keep himself well clad, to be careful as far as he can be in diet, and to avoid excess of any kind. While taking mercury it is advisable to forbid alcohol, and, if taking the drug by the mouth, to stop smoking, if the patient can be induced to submit to this.

(2) *Inunction.*—If there is early upset of the bowels when mercury is given by the mouth, a very good method to try is *inunction*. The preparations in common use are blue ointment and the oleate. Many patients, however, object to this method, because it takes some time to apply, it is disagreeable and dirty, and stains the clothes. For these reasons, therefore, I do not think the method is likely to be much used in the army, though it has its advantages in some cases in private practice. From the medical point of view, also, there are objections : viz., that it is uncertain how much mercury is absorbed—*i.e.*, the dosage cannot be accurately fixed ; and, secondly, in some patients, after employing the method for a time, salivation may quite suddenly come on.

A drachm of blue ointment is rubbed into the axilla, or groin, or sole of the foot, every morning for ten to fifteen minutes, and the part well washed every evening. If this preparation is found to be too strong, the mercury may be diluted with prepared lard and suet in the following proportions, as used at the London Lock Hospital :

℞	Prepared lard	ʒvi.
	Suet	ʒiv.
	Mercury	ʒv.

M. Ft. ung. Sig. : A small quantity to be used as directed every morning.

In some cases inunction leads to an eczematous eruption, which may persist or recur, and for a long period resists treatment even when the use of the ointment is stopped. If salivation comes on (it may do so quite suddenly), or even if tenderness of the gums is produced (as it is usually in two to three weeks), the administration must be stopped in the former case, while in the latter the quantity used or the frequency of inunction must be reduced.

This method is also of use in the tertiary stage, if it is deemed advisable to give mercury, either with or after a course of iodide of potassium. If the case be one where there is doubt of its being tertiary or later secondary (and infective, therefore), the mercury may well be given as an inunction, while iodide is being taken by the mouth.

The same regiminal and hygienic precautions must be attended to as when the drug is taken by mouth. If constipation be present, *mild* purgatives should be given, and if the patient is debilitated, tonics, as quinine, iron, cod-liver oil, etc.

If a patient be weighed before beginning a course of mercurial treatment, and again at short intervals, it will be found that he loses weight for the first week or so ; after that, it is not only regained, but the patient puts on flesh.

Also I have made weekly examinations of the *blood* of patients undergoing a regular course of mercurial treatment, and find that in nearly every case the hæmacytometer shows an increase in the number of red corpuscles. I say advisedly in ' nearly every case,' because those who do not seem to be benefiting by the course, whether from an unsuitable preparation being selected or from the patient being so debilitated that he does not take mercury well, often show a relative diminution in the number of red cells. I am strongly of opinion that this point might be made one of considerable clinical importance, as the following case will show :

Private J. K., in one of the line regiments, came into hospital with a typical Hunterian chancre, which he said he had contracted four weeks previously. He was put on liquor hydrarg. perchlor. by the mouth, and warned as to keeping his mouth and teeth clean. Fourteen days later he began to complain of soreness of the throat and gums. There was redness of the throat and fauces, and shallow, irregular ulcers began to develop over the cheeks and gums in the neighbourhood of the left lower back molar. With the exception of one jagged stump the teeth were sound. The ulcers becoming painful, the patient neglected to clean his teeth. The point in question now was whether his idiosyncrasy was such that he was very susceptible to mercury (he had only taken 30-minim doses of the liquor in 1 ounce of water, three times a day), and was getting mercurial stomatitis; or whether the ulcers were syphilitic in nature; or, finally, whether he was suffering from an ordinary stomatitis arising from the jagged stump, unclean teeth, and weak state. The stump was removed, but the condition of the mouth did not improve during the next few days. The corpuscle number on admission was increased at the next count, a week later, and at the third count (when the ulcers were developing) the number was still larger. The state of the patient's blood, therefore, pointed to good progress, and the mouth affection was accordingly attributed to syphilis; the perchloride of mercury was increased to 1-drachm doses, with the result that improvement was rapid and maintained. Without the knowledge gained by the use of the hæmacytometer the mercury might have been stopped, valuable time in treatment lost, and the patient kept, perhaps, even longer from the drug, owing to his supposed idiosyncrasy.

A weekly examination should be made of the urine of all patients undergoing a course of mercurial treatment, for the presence of albumin is a danger-signal, warning us either to stop the administration or at least to diminish considerably the dose. If the warning be neglected, salivation will in many cases speedily ensue.

(3) *Fumigation.*—This form of administration is most suitable for cutaneous manifestations; it may be combined with the careful use of mercury internally. A very satisfactory method is to employ the united vapours of calomel and steam in the form of a moist bath. The patient sits naked in a cane-chair, surrounded up to the neck by a large blanket arranged to exclude air. A ready and efficient substitute for a more elaborate apparatus consists in placing a hot brick under the chair, the calomel and saucer (or other receptacle for water) upon it, and the patient's body is subjected to the fumes till the calomel is evaporated: this takes about a quarter of an hour. As long as the patient's strength is well maintained this process should be gone through every night,

but if much debilitated, then every two or three nights, the mercury being administered by mouth in the interval. The vaporized mercury should not be removed from the body, but the patient should go at once to bed. I have tried this method a few times already, and have had good results as regards the skin affections, the disappearance of the symptoms being in some cases remarkably rapid. It does not appear to be a very satisfactory method, judging from the experience of others as well as my own, for any but the cutaneous manifestations of syphilis, and although persevered with after the disappearance of these, nevertheless other (not cutaneous) manifestations occur. I think, therefore, that it acts almost entirely locally, and, although leading to the disappearance of the symptoms, does not cure the disease. If this point were more realized, and the method used in carefully selected cases—viz., where the skin is mainly involved—and followed by some other form of administration when the eruption had disappeared, fumigation would be found more satisfactory than it is usually considered to be, and the method would not meet with so much unmerited abuse.

(4) *Subcutaneous Injection.*—This, first introduced some thirty-five years ago, has largely given place to the method next described ; but in that it still finds some supporters (especially in Germany), a few words concerning it are called for. It is recommended that the insoluble salts should be injected in a state of suspension, so that absorption may be slower. There are three great drawbacks to this form of administration :

(*a*) It is difficult to find out how much of the drug is absorbed.

(*b*) A good deal of pain is caused.

(*c*) Not infrequently the irritation set up is such that local abscess may result.

(5) *Intramuscular Injection.**—This has many advocates, and is still gaining an increasing number of adherents. Excellent results are shown in a paper by Lieutenant-Colonel Lambkin, R.A.M.C., published in the Annual Report of the Army Medical Department. It is a particularly useful method for combating syphilis in the army, inasmuch as the injections do not require to be made frequently, and the man can be treated as an out-patient, can perform his ordinary duties, and present himself for treatment at regular intervals. The

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* Introduced by Scarenzio in 1864.

insoluble and soluble salts of mercury, as well as the metal itself (as 'grey oil'), may be employed; but the first-named often leads to painful swellings at the seat of injection, or even local abscesses, and at times to severe mercurialism and stomatitis. Nearly all the soluble salts have been used from time to time, but the best of them are sal alembroth (recommended by Mr. Alfred Cooper, F.R.C.S.) and sozoiodol of mercury (recommended by Mr. E. Cotterell, F.R.C.S.), dissolved in sodium iodide. For the first the following formula is satisfactory:

℞	Hydrarg. perchlor.	gr. xvi.
	Ammon. chlor.	gr. viii.
	Aquam	℥i.

This may be injected in doses of 10 minims, equivalent to $\frac{1}{3}$ grain of sal alembroth (Cooper).

For the latter:

℞	Sozoiodol of mercury	gr. xii.
	Sodii iodidi	gr. xxiv.
	Aquam	℥i.

Also 10 minims for the dose. This last is perhaps to be preferred, since it appears to cause less local discomfort to the patient than does the former (Cotterell). Lieutenant-Colonel Lambkin states, however (*British Medical Journal*, May 30, 1903), that after trying the perchloride, sal alembroth, sozoiodol, and metallic mercury, he is convinced that the last-named is the most efficacious, more so even than the soluble salts. The formula he recommended is:

℞	Hydrargyri	ʒii.
	Anhydrous lanoline	ʒii. (by weight)
	Paroleine (B. and W.)	ʒiv.
	Carbol	2 % (by measure)

The lanoline and mercury are rubbed up together till the latter disappears, and the other constituents are then added. The injection is made in doses of 5 to 10 minims once or twice a week, according to the nature of the case. The main points claimed in favour of this preparation are:

(*a*) That the carbolized paroleine does not change consistence in the cold, and can be drawn into the syringe, whereas carbolic oil becomes semi-solid at low temperatures, and requires to be heated again before use.

(*b*) That it is less painful than other forms of mercurial injection.

(*c*) That it is more slowly absorbed, and perhaps on that account—

(*d*) Has more marked effect on the symptoms and ultimate cure of syphilis.

If the method of intramuscular injection is adopted, the best site is the gluteal region. The injection should be given slowly, well into the muscles. There is very little discomfort so caused, merely a bruised feeling, which soon passes off. 'The operation should be carried out once a week in most cases for six or seven weeks, later fortnightly for three to four months, then once a month for a year or eighteen months, taking altogether eighteen months to two years. Thereafter, for another year, the patient should be under occasional supervision, or, at all events, should present himself, say, monthly, for inspection, in order that any relapse may be immediately detected.' Whether the above preparation or any other be used, the following precautions (*loc. cit.*) should be observed in all : (*a*) Avoid irritating or caustic preparations ; (*b*) use sterile solution or mixture ; (*c*) use it freshly prepared ; (*d*) render the skin aseptic at the site of puncture, and also sterilize the instrument ; (*e*) use syringe with vulcanite mounts to avoid oxidation ; (*f*) platino-iridium needles should be used, since steel is liable to rust (though I am told that steel lasts well if properly washed with water, and then with absolute alcohol). The former have harder points, and are therefore less easily blunted, and are not so expensive now as heretofore. The following are the general advantages of intramuscular injections over other forms of administration :

(*a*) Treatment is entirely in the hands of the medical officer, and therefore the prescribed amount of mercury is known to be administered.

(*b*) A definite amount of the active principle is introduced into the system.

(*c*) No diarrhœa or dyspeptic symptoms are set up.

(*d*) Salivation is very rare.

(*e*) Injections may be given more frequently if a rapid effect is desired. It is therefore a good method of commencing treatment in grave cases of syphilis, or where there are threatening visceral lesions, to get the patient under the influence of the drug as soon as possible.

Complications may follow intramuscular injection :

(*a*) *Pulmonary Embolism.*—This will not occur if Lesser's two-stage method be employed.

(*b*) *Sloughing.*—Rare unless a blood-vessel or nerve is wounded in making the injection.

(*c*) *Hydrargyrism.*—Only when comparatively large doses have been given ; therefore start with small quantities until it is seen whether the patient has any special idiosyncrasy as regards the effects of mercury.

(6) *Intravenous Injection.*—Yet another method by which mercury may be introduced into the system is that of *intravenous injection.* I have never tried this, and am, therefore, not qualified to speak of the results which are claimed for it by Baccelli (*Berlin. klin. Woch.*, 1894).

Before passing on to the detailed description of iodine and other drugs used in the treatment of syphilis, a few words will be said concerning occasional untoward results of the administration of mercury which have not as yet received mention. In some cases when mercury is locally applied, as by inunction, a dermatitis may be set up, varying from slight erythema to a severe eczematous eruption, according to the strength of the preparation employed, or to the susceptibility of the patient. This condition, usually of a strictly local nature, may in rare instances become generalized, and even fatal results have been recorded (known in former years as hydrargyria, mercurial disease, etc.). The condition is better understood now than in former days, when it was attributed, not to the remedy, but to the disease, and the mercury was therefore pushed, leading thus to a fatal issue. Various rashes may also at times appear when the drug is given in other ways, as by mouth or intramuscular injection. It behoves us, therefore, to be exceedingly careful to distinguish between the drug rash and that due to the disease, because in both cases the eruption is liable to be multiform. Into the question of this diagnosis it is not within the scope of this essay to enter. The offending remedy must be immediately stopped, but the eruption will probably persist for some time. The other excretory systems, kidneys and bowels, must aid in the elimination ; therefore diuretics and aperients should be given. Milk itself acts as a good diuretic in many of these cases.

Potassium iodide is often recommended as hastening the elimination of metallic poisons—*e.g.*, lead—but in the case of mercury this is a somewhat risky proceeding, for it gets rid of the metal by releasing it from the tissues into the circulation, and will probably, therefore, not alleviate but aggravate the symptoms. The local treatment of the dermatitis must be carried out as for similar skin affections arising from other causes.

Iodine.—As regards the next most important drug employed in the treatment of syphilis, iodine, nearly always prescribed in the form of iodides, there is not so much to be said as in the case of mercury. Iodine itself is not given internally in the treatment of this disease; it is only used externally as the liniment or tincture for application to glandular enlargements, etc., and even then it is doubtful whether the action is more than that of any similar counter-irritant, for such conditions, when due to non-specific causes, are as frequently found to yield as those that are syphilitic.

The action of mercury appears to differ in essential from that of potassium iodide. The former may be regarded as a poison, which can be introduced in such quantity into the blood as to prove fatal to organisms before the living tissues are affected; whereas the iodide has, in ordinary cases, no such toxic action, and appears to affect only the morbid processes of the body, and to have no action on the normal tissues.

The potassium salt is almost invariably the one prescribed. It is usually better to give quite small doses at the outset of treatment, such as 3 to 5 grains thrice daily, and to gradually increase the dose; but in syphilitic bone disease and where the nervous system is attacked much larger doses are often required, even up to 60 grains three times a day. It is better, especially when large doses are ordered, to give it well diluted and after meals. Better results from its administration seem to be obtained by adding ammonium carbonate (2 to 3 grains) to each dose, or by giving it with some effervescing water, the latter being generally preferred.

The following are some of the unpleasant symptoms that may occur in a patient taking iodide of potassium: Some, but happily not very many, show a marked idiosyncrasy in this respect, and are unable to take even comparatively small doses, but if the dose be increased, the drug may be better tolerated. Nausea, vomiting, epigastric pain, and purging may be induced, with catarrhal symptoms, frontal headache, lachrymation, œdema of eyelids and nostrils, and 'iodide rash,' together with constitutional symptoms, such as depression, anorexia, malaise, and general discomfort. The latter may, and often do, occur without the gastric and catarrhal symptoms.

The rash, as a rule, appears earliest on the face, the so-called 'iodide acne' being a pustular folliculitis. Arguing from this, we find, as we should expect, that bullous syphilitic eruptions, far from being remedied, are aggravated by potassium iodide. A case of erythema multiforme has been lately reported as becoming markedly bullous when treated by the iodide in small doses with mercury, in the belief of its being syphilitic.

Most of the untoward effects of the drug are obviated by giving with it carbonate of ammonium ; but, as advised by Cooper (*loc. cit.*), if they still persist, the potassium salt may sometimes with benefit be replaced by the corresponding ammonium or sodium compound. If still untolerated, recourse must be had to rectal administration, 20 to 30 grains being given in an ounce of thin mucilage ; but, personally, I have never had occasion to resort to this.

The treatment of iodism, should it arise, is based on what has already been stated under mercury—viz., stopping administration of the drug, and eliminating by kidneys and bowel. But a further word of warning may be added : Never use potassium iodide in bullous eruptions, and stop it if bullæ occur during its administration, because its use has led to sloughing about the site of the bullæ.

Potassium iodide has a great effect on symptoms, particularly in cases of syphilis of the nervous system, if seen sufficiently early, by removing the results of the syphilitic process, but I venture to doubt whether it has any actual curative effect ; for we must remember that it is practically useless in primary or earlier secondary manifestations, but is most beneficial in later secondary and tertiary, where the causative organism is supposed to be quiescent, if not dead, and only the results—the débris, so to speak—of the specific process have to be cleared away. It is, therefore, always advisable to accompany or follow (according to the stage of the disease) the iodide course by one of mercury.

After a prolonged course of mercury without any bad effects being produced, it is sometimes found that, on giving iodide of potassium, salivation is brought on. The reason is that 'when mercury has been taken for some length of time, it seems to be deposited in an insoluble form in various structures of the body.' The iodide, by producing tissue change, brings out this stored mercury and promotes its reabsorption. A twofold lesson may be learned from this: firstly, that if mercury is not producing further beneficial effect, a small quantity of iodide, by liberating unabsorbed mercury, may lead to its having its proper action upon the disease; and secondly, after a prolonged course of mercury we must be very cautious in beginning the exhibition of iodides.

By some observers potassium iodide is said to produce salivation of itself. I think, however, that they have probably mistaken the catarrhal symptoms, which may affect the mucous membrane of the mouth, just as that of the nose and eyes, for true salivation, or it is produced by liberation of stored mercury, as above stated.

Mercury and iodine have been given combined, but the results of such are not on the whole satisfactory, except in the later secondary and tertiary stages. I have already mentioned the use—or, rather, points against the use—of the green iodide for the primary induration and early secondaries (p. 140). The proto-iodide, if used, is better given in the form of powder or tabloids, because, as already stated, it is oxidized in the presence of moisture. One great exception must be made to what has been said of the combined drugs—viz., in tuberculous subjects, and, perhaps may be added, in cases with obstinate tertiary symptoms, mercury and potassium iodide together may do much good. There is yet another point to bear in mind when giving iodide of potassium. If the patient is cachectic, anæmic, and debilitated, tonics will also be needed, otherwise the iodide seems to aggravate the symptoms instead of benefiting them. If the cachexia is at all advanced, tonics may have to be given first until the patient's general condition is improved, when the iodide will be found to do its work very effectually: this is important. Together with tonics and throughout treatment, as previously mentioned, the diet must be nutritious, stimulants ordered in moderation only as a tonic, and regulation of exercise and general *régime* must be attended to.

I pass on now to the consideration of other medicinal remedies, though far inferior to the two already discussed; but in patients who are unable to tolerate these drugs the following may benefit, or if the iodide is badly borne when given in the ordinary way, it may be tolerated in one of the **vegetable decoctions.** Sarsaparilla and guaiacum are the two thus employed. The former used frequently to be prescribed as a vehicle for potassium iodide, and, of course, often with beneficial results. It is, however, difficult, if not impossible, under such circumstances to judge what part of the result is attributable to each. But in some cases the decoction alone is undoubtedly of service. Thus, in a case of thickening of the lower end of the femur due to periostitis or osteo-periostitis, which was at first regarded as sarcomatous, but was probably of specific origin (as the event proved), potassium iodide had been patiently tried and pushed in vain, when large doses of the decoction of sarsaparilla (a pint in twenty-four hours) brought about a considerable improvement, and on further exhibition of iodide the condition cleared up altogether. I doubt whether this was due solely to the tonic action of the drug, for other tonics had been previously given without affecting the syphilitic condition, but whether it possibly benefited by acting as a vehicle and adjuvant for iodine already in the system I am unable to say.

The second, guaiacum, 'regarded as the specific for syphilis in the sixteenth and eighteenth centuries,' is found to do good in cases of chronic syphilitic osteitis and arthritis, associated with signs of periarticular rheumatism or fibrositis (Gowers ?). It is possible (though hardly probable, since it formerly enjoyed such a reputation as a specific) that its good effects are due to its action on an ordinary arthritis of rheumatoid nature, becoming, as it were, grafted on to a syphilitic one, for the drug is found to give relief in ordinary cases of chronic rheumatoid arthritis as in the time-honoured 'Chelsea pensioner.' It may be given with or without iodide of potassium; if the latter, the beneficial effect is considerably increased by hygienic precautions, such as vigorous promotion of the action of the skin, administration of aperients, careful regulation of diet, and so forth (Cooper, *loc. cit.*).

Before leaving altogether the subject of treatment by vegetable decoctions, a few words ought to be said concerning a method at present, so far as I am aware, not employed, but one which formerly held a fairly high reputation, and probably, with the backward swing of the pendulum of medical opinion, will again come into use for selected cases. I refer to what was known as Zittmann's decoctions. In reading reports of cases in which aggravation of symptoms, instead of amelioration, seemed to follow the administration in the ordinary way of mercury and iodides, a course of this Zittmann treatment, extending over some fourteen days, certainly at times appears to have given speedy relief. The salient points only of the treatment can be mentioned here. There are two decoctions, the strong and the weak. The former contains sarsaparilla, calomel, and the red bisulphide of mercury, with senna, liquorice, and other ingredients, and from this is made the weak by addition of sarsaparilla and other adjuvants and a larger proportionate amount of water and boiling down. Before beginning the course of decoctions, two pills are given, containing 2 grains each of calomel and extract of hyoscyamus and 5 grains compound colocynth extract. The patient then takes the decoctions in large but regulated quantities for five days, again takes two pills, then for another five days the decoctions as before, and so on for a third course. During the treatment the diet is very carefully regulated, no fruit or sweets being permitted, and not much meat beyond fish and poultry. There is a preparation known as Syrup Trifolium Compound of Messrs. Parke, Davis and Co., which I found of benefit in a patient who was unable to take iodides in any other way. This syrup consists of a mixture of vegetable alteratives containing potassium iodide (8 grains to the ounce). The ordinary dose is one tablespoonful thrice daily. Mercury can be given at the same time for treatment of secondary syphilis, and is well borne by those who are unable to take the latter (mercury) alone.

The **expectant treatment** of syphilis must also receive a few words of mention. This method is really a sort of half-hearted way of administering mercury and iodide. The main features of it, as set forward by Ziessl in his 'Lehrbuch,' are: 'The primary induration is treated with some simple local application. When the eruption appears he gives an iodine preparation; and, if six weeks later the eruption still remains or other symptoms show themselves, mercury in some form is prescribed.' The method is illogical, because mercury is obviously beneficial in the treatment of secondary manifestations, and these are usually milder when mercury is given early.

Other therapeutic measures have been from time to time reported; these will only receive cursory mention here, since I have had no personal experience of their action.

(1) **Animal Serum Treatment.**—This is based on the fact that animals have not, up to the present, been inoculated with syphilis; their serum was, therefore, supposed to render animals naturally immune.* Thomasoli and Cotterell, amongst others, have advocated this as a means of treatment. Beneficial effects, both on the general health and on the disease itself, have been reported, but the serum has not been tried in a sufficient number of cases to warrant any definite conclusion as to its efficacy.

(2) Similarly with **thyroid extract,** though it certainly leads to some improvement in, and even disappearance of, some of the skin affections of syphilis, nevertheless, it has not been tried sufficiently often for one to say whether this form of treatment is curative or merely palliative.

(3) The so-called treatment by **syphilization,** introduced toward the middle of the nineteenth century as both curative and prophylactic, is obviously to any student of syphilis absolutely illogical, and has happily now no advocates of any note, even in Norway, where for a time it was principally in vogue.

The Treatment of Syphilitic Disease of the Nervous System.—Paradoxical though it sounds, 'there is no syphilitic disease of the nerve structures.' The parts actually involved are the neuroglia, the membranes, and blood-vessels. The degeneration of the nerve structures themselves is post-syphilitic, or, as some denominate it, parasyphilitic—that is, the changes in the nerve elements are simple, and not specific, though secondary to the specific disease. Antisyphilitic treatment acts on the specific process directly, and indirectly only does it influence the changes in the nerve structures by which the symptoms are produced. Thus the symptoms due to gumma of the brain do not differ from those produced by presence of a tumour of any other nature.

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* Metchnikoff's discovery that certain species of monkey can be infected with syphilis opens the way to important developments; but his suggestion that the serum obtained from these inoculated animals should be employed for preventive inoculation in man is very premature, and fraught with great danger, for the results reported by the discoverer and Roux from the use of such serum are by no means constant.

The more acute the syphilitic process, the more does it partake of inflammation, and, therefore, the less amenable is it to specific treatment. The prognosis is favourable in proportion as the symptoms which depend directly upon the simple changes, secondary to those of true syphilitic nature, can pass away when the latter cease to act under the administration of specific remedies. A few words only on the pathology of these cases will clearly show the reason of the different actions of drugs when the nervous system is attacked. The 'newer tissue elements of the growth are cellular in nature, and under specific treatment they undergo granular degeneration, and the débris is quickly removed ; but those elements of older standing undergo fibrous change, and just as treatment aids the disintegration and absorption of the newer elements, so it seems to hasten the fibrous change of the more mature.' Thus we find that after a temporary improvement, due doubtless to the removal of the disintegrated newer cells, continued diminution in size of the growth leads to aggravation of symptoms from contraction of the elements undergoing fibrous change, and resultant pressure on the nervous structures proper. Thus Sir William Gowers reports a case in which annular contraction of a sclerosed artery by treatment led to total occlusion. Generally speaking, it follows, from what has been stated, that 'the more rapid the development of symptoms, the more does the process partake of the nature of simple inflammation,' and the less, therefore, is the result from specific treatment. Thus in acute transverse myelitis the course differs in practically no point whether the patient be syphilitic or not, and in this disease antisyphilitic treatment has little or no effect.

Even in the tertiary manifestations in the nervous system mercury is often said to do more good than iodides, because after a course of the latter, if mercury be given, the improvement continues. But a different explanation may be given for this—namely, that the iodide has removed the débris, the specific products, and during the subsequent treatment the functions of the nervous system become slowly restored.

Only in a few special cases is it of benefit to give mercury and iodide together, such as in a case of urgency, and for a short time, because elimination of mercury is aided by potassium iodide, and retention of the former is, therefore, prevented, and the action of the specific process delayed, but it allows the drug to be pushed. Thus, if the drugs are given together, the gums are not so easily affected, because sufficient mercury does not remain in the system. The effects of giving the drugs together after a prolonged course of mercury alone, and the dangers likely to arise therefrom, I have already spoken of (p. 150).

We must be careful not to be led away by the fact of fresh symptoms appearing while the patient is taking iodide, and infer that therefore the disease is not syphilitic; for this drug, if long continued, certainly seems to lose its effect, and the new lesions may be shown post-mortem to be syphilitic. Though many think that long-continued treatment in the tertiary stage is essential, I beg leave to differ on this point; for the fact that other symptoms may develop while the patient is taking iodide seems to point out that the organism may become, as it were, 'acclimatized' to the drug, and develop in spite of it. Nevertheless, though this is so, a large increase in dose may arrest the development, hence the heroic doses sometimes given in long-continued treatment; but this increase cannot go on indefinitely.

Sir William Gowers thinks that after eight weeks' energetic treatment the specific element is at an end, and that all that remains is the non-specific, the secondary simple effects, and these can only slowly pass away and rarely entirely. This later improvement is often wrongly attributed to the continued use of iodide, whereas the disease would in all probability have slowly improved any way after the brief (six to eight weeks') energetic specific treatment. As a control test, I watched two patients suffering from paralysis due to cerebral syphilis. One was taking potassium iodide and the other merely the ordinary tonics. For the first eight weeks or so the former seemed to make greater improvement, but after that time I was unable to discover any important difference between the conditions of the two cases.

5. The Prevention of Syphilis in the Army.

We have now arrived at the final section of this essay, dealing with the means which should be adopted to prevent as far as possible the ravages of syphilis in the army. Though treated here in a separate section, this has really an intimate connection with the last, since it is part of the treatment of the disease—the prophylactic treatment.

In 1902, at the meeting of the British Medical Association, a resolution was unanimously passed by the section of Psychological Medicine requesting that something should be done to prevent the ravages of syphilis, ' which caused an incalculable amount of physical suffering and disability, of which blindness and paralysis are two principal examples, and which is accountable for a considerable proportion of the cases of mental incapacity which crowd the asylums and burden the rate-paying community.' The civil authorities, however, have so far practically achieved nothing. Let, then, the army point out to them what may be done, and by showing the results of the methods that they undertake, conclusively demonstrate that no improvement can possibly result from an erroneous principle of mere *laissez-faire.*

This part of the subject will be dealt with under two main headings :

(1) Preventive measures as regards the soldier.

(2) The lessening and regulation (since it is beyond prevention) of the *fons et origo mali*—prostitution.

What I have to say in this section hinges largely on that already stated in Section 3, dealing with the causes of syphilis in the army ; and in order to avoid unnecessarily taking up space by vain repetition, I will speak of the preventive measures in the same order as the causes are there given.

Age.—The youth and consequent inexperience of the soldier may be considerably counteracted by increase of knowledge of the risks run, the dangers and hideous consequences to which soldiers render themselves liable by promiscuous intercourse. General education prior to enlistment is already doing some good in this direction by raising the whole tone of the lower classes, by giving them something to think of and to occupy their minds with in spare time, but it does not do sufficient. As more particularly applicable to the case of the soldier, the distribution of some small pamphlet on the subject, written in simple language, so that its teachings and warnings may be readily grasped by the lay mind, would open the eyes of many who at present think the dangers exaggerated to an absurd degree.

In such a pamphlet—or, better, as introduced into a series of semi-scientific lectures, which never fail to draw—let the men be warned of the dangers they run by promiscuous intercourse ; dangers to themselves of contracting the disease, the endless miseries and deterioration of health and moral character thereby entailed ; dangers to others, such as the wives if the men be married, and the children, who, alas ! so frequently appear as awful examples of the 'sins of the fathers' —weakly, sickly, ill-developed, a burden to others and, if they grow up, to themselves also. Let them be made to understand that it is not the habitual debauchee (as is so frequently thought) who contracts the disease, but that the first illicit connection is just as likely to result in syphilis as a later one ; it is merely a matter of chance, with heavy odds of at least three to one in favour of the disease. Let them be told that, though natural, nevertheless sexual relations are not necessary to health ; the majority of soldiers have that erroneous idea firmly fixed in their minds. As Fournier has stated : 'I do not know, neither have I ever observed, any dangers resulting from continence.'

But since all men are not constituted alike, and in some the sexual desire is more difficult to resist than in others, let the men be taught how the risks may be minimized by careful personal cleanliness, and the effects better counteracted by reporting to the medical officer for treatment at the very first indication of disease, instead of wasting time and money, as many do, on chemists and quack preparations. I say 'minimized,' for they must also be taught that, even after every precaution, every care has been taken, a single inoculation is all that is needed to start the disease.

Class of Men Enlisting.—Now that the pay in the army is so high, a better class of men is found willing to enlist. As long as payment was poor, the class of material obtained was not likely to be good, and when one considers how much money is spent in keeping non-effective men in hospital, or men almost non-effective owing to their repeatedly 'going sick' for venereal disease, one can easily see that better pay does not mean waste of money, for more men will enlist, and a better class of men, who would be less likely to give way and contract the disease owing to the greater loss by hospital stoppages, and the authorities would be able to weed out the bad offenders, the chronic venereal men, to the betterment of the army and the saving of public expense.

Cleanliness.—As a sequence from the last two points, it follows that if a better class of men is obtained, men better educated, cleanliness will be more observed. But while the men are of the present class, let it be some one's duty—say that of the non-commissioned officer in charge of the barrack-room—to see that his men pay attention to personal cleanliness. Let there be regular inspections to see that they have proper baths, and let the medical inspection be more thorough than it usually is at the present time. There is a regular weekly inspection of chest, arms, and hands for rashes and scabies ; but how often are the primary indications of syphilis, I will not say concealed, but overlooked (for the men may hardly be aware of their presence), owing to the inspection being hurried and incomplete.

Means of ablution are usually plentiful in barracks, but antiseptics might also be kept. Corrosive sublimate (1 in 1,000) is in many cases a satisfactory preventative if used within eight hours. This, if used, must be kept under surveillance, because of the danger of men returning drunk to barracks and poisoning themselves with it.

Environments.—A better educated class of men will soon lead to a better condition of the soldiers' environments. Let the recruit see and understand that the contraction of venereal disease is not to be regarded as the 'guinea-stamp of manhood,' but that it does interfere with success in the army. This might be accomplished by instituting a rule that no non-commissioned officer shall be made of a man whose self-control is of such a poor standard that he falls victim to venereal disease again and again. At the present time this seems to be no detriment whatever. I was actually told by a lance-corporal who had been under my care twice in four weeks—first for soft chancre and then for gonorrhœa—that, though he had been promoted from the ranks only a short time before, he was in no wise ashamed, and knew (he said) that it would not do him any harm in the service, but that he would be considered more a man of the world, and his seniors would not think it at all detrimental. On asking his company officer's opinion of this patient, I was told that he was one of the best non-commissioned officers in the regiment, and that his promotion would probably be speedy, and the officer 'didn't care if the man caught venereal disease every week of his life ; that was not his business.' Of this regiment, the venereal ward would contain about 25 to 30 per cent. of corporals and lance-corporals.

No ; let there be some deterrent, and the result of contraction of venereal disease be, say, reversion to the next junior grade in the case of a non-commissioned officer, and ineligibility for promotion to the former grade, or to that of lance rank if a private, for some definite time—say six months clear from the contraction of the disease—a 'V' in red ink being placed on the medical history sheet or defaulter sheet to mark the date. Self-indulgence in alcohol is always punished, where detected. Why should self-indulgence in another form, which causes far greater and longer incapacity from work, not only fail to meet with any punishment, but be looked upon with commiseration and sympathy ?

Disciplinary measures regarding the disease from a similar point of view as drunkenness have a good deal to recommend them ; but, on the other hand, there is much to be said against them. For example, if the measures partake of the nature of punishment—and to a certain extent they must do so—there is increased inducement to concealment of disease ; also drunkenness or alcoholism is met by almost immediate punishment, whereas the effects of measures adopted for cases of syphilis are more remote and far-reaching, and the punishment does not always fit the crime.

Alcohol itself, as has been said, often leads to venereal disease by depriving a man of his power of self-control, and making him an easy prey to temptation ; and also by lighting up an old affection, such as gonorrhœa, or bringing on a relapse of syphilis by general lowering of tone. Let the young soldier be taught by example, if not by precept, to exercise moderation in liquor and self-control when visiting the canteen, for this habit will lead to vice, and this vice to others. The French were of a surety right when they stated : 'The alcoholic almost of necessity becomes syphilitic.'

Free Time.—Since writing on this subject in the earlier section, the order granting all-night passes to soldiers practically without exception has happily been rescinded ; therefore, no further remarks on that point are called for. There still remain, however, the hours during the day and evening when the soldier is 'off duty.' It is a point which should be well considered by every commanding officer how his men may best be kept out of mischief during that time. Entertainments of a good character should be judiciously arranged, so as to keep the young soldier from spending too much time in less profitable places, keeping out all recitations, songs, etc., of a doubtful nature, to avoid the chance of older soldiers poisoning the minds of the younger with lewd stories and ribald songs, which only too readily take hold of the uncultured mind. If a man knows that a concert will be a good one, even though above him, he will come and listen eagerly to it, and will, in fact, say afterwards that he really enjoyed it more than an entertainment of a lower class. Interesting readings, lectures, and a good library will all do their part, and a large part, in keeping the recruit from paying too prolonged or frequent visits to the canteen. Let all places of entertainment of disrepute outside barracks be forbidden, for it is such that are frequented by prostitutes of a low order, are supplied by liquor of an indifferent, if not bad quality, are kept up almost for the sole purpose of making money by pandering to vice.

Let there be an end to the present lenient view with which the contraction of venereal disease is regarded by many officers—regimental, departmental, or medical : in the former case, by refusing to accept recommendations for promotion of men or non-commissioned officers addicted to venereal indulgence ; in the latter, by notifying to medical officers that, in making out invaliding documents, careful consideration is to be given in replying to the question whether the man's condition has been aggravated by intemperance, vice, or misconduct, for, as has been already shown, each and all of these terms may be applied to venereal disease.

Early marriage has been put forward as a means of lessening the disease in the army, and undoubtedly in those who cannot resist the temptation of sexual intercourse it may be of benefit ; but there are two points of importance to bear in mind : firstly, that it is not at all unlikely that such a man has already contracted the disease ; and, secondly, that no syphilitic must be allowed to marry until he has been under thorough treatment for at least two years, and free from any symptoms, although untreated, for at least another.

In the same way as notices are put up warning men against drinking unsuitable water, so let there be notices posted in the barrack-room warning against the dangers of contracting disease, notably syphilis, by sharing one another's pipes or drinking-mugs, using another man's fork or knife, or wearing his shirt, sleeping in his blankets, etc., and in places where tattooing is in vogue, telling them of the possibility of the disease being so contracted.

Another way of gaining the same end—more difficult, I think, to carry out in practice than it appears in theory, but still quite possible—is that which I may call *partial segregation.* By this I mean that such soldiers as are undergoing treatment for syphilis, or who are still under observation, and are therefore considered capable of conveying infection, should occupy other barrack-rooms than their non-syphilitic comrades ; that they should have a separate latrine and ablution accommodation ; but that, as regards duty, drill, and games, they may be allowed to carry out the former and join in the latter with the rest. A further and more potent means of prevention might thus be put to the test by placing certain restrictions upon the men so segregated, such as refusing all-night passes, and so preventing them from infecting prostitutes, and through them their fellow-soldiers. There would also be a considerable moral effect produced by the stigma which would to a certain extent attach itself to the men so segregated.

Surgical Syphilis.—What has been described under this heading in Section 3 is exceedingly rare. I have not myself met with a case since holding civil hospital appointments, though I have read the records of medical men who have had that painful experience. It is not only rare, but, being due to accident or carelessness, a strict inquiry should be made into every case which arises in this manner, and the blame visited severely upon the person responsible.

The precautions which would obviate any possibility of contraction of syphilis by vaccination have already been dealt with (p. 133).

Inoculation.—Attempts to limit the disease by this means have so far been not only unsuccessful, but positively harmful. This is no place to describe the various means which have been tried towards achieving this end, but the results may be briefly summed up as follows :

The idea of inoculation, syphilization, prophylactic and curative, created great sensation about fifty years ago ; but this idea was erroneous, based on the fallacious supposition that the virus could be inoculated upon a patient already syphilitic. Thus, some replaced mercury in treatment of secondary syphilis by inoculation of virulent pus. All the cases cited in support of this, however, failed to justify it, tertiary symptoms manifesting themselves in due course. The next step, following up the analogy between vaccinia and small-pox, was to attempt inoculation of animals, and thereby to obtain an antisyphilitic serum. It will be seen that this is merely a slightly altered view of the problem stated above concerning what was thought of the natural immunity of animals from the disease, and the consequent possibility of employing their serum as curative, and perhaps also as a prophylactic.*

Inoculations upon those already infected have no result, the patient being already immune. Inoculations on the non-syphilitic merely gave rise to the disease itself, and therefore led to disastrous results. Even if an attenuated virus were obtained from a syphilized animal, it would, I hold, be criminal to use it for inoculation of a healthy individual, for we have all seen what began as a mild attack develop into a virulent form in later secondary and tertiary stages ; and, therefore, to convey to a healthy person a disease which may retain its hold for months, or even years, and may exhibit unaccountable exacerbations of virulence, is, I maintain, not only unjustifiable, but criminal.

We now reach the last stage of the inoculation idea. This is not prophylactic, but was supposed to be curative, and, if it fulfilled expectations, would hasten recovery, and so lead to decrease of syphilis in general. It was advocated by a Russian surgeon, acting on the idea that in the tertiary stage a patient's serum contains antisyphilitic substances, and that this serum may be used for hastening the cure of a patient in the earlier stages of the disease. The conclusions arrived at from his experiments and researches are :†

(1) That the injection of the serum led to marked ameliora-

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* De Méric.

† Vieviorovsky.

tion in general health, the patients feeling stronger, and putting on weight.

(2) The syphilitic manifestations healed (as primary chancre) without local specific treatment ; but

(3) Although the injections were continued after the local symptoms had disappeared, relapses occurred, which were more obstinate to treat than the original manifestations.

The subject about to be discussed will be the last one of importance in this essay. Not only is it of paramount importance, but it is a subject which requires more careful consideration, and calls for more delicate handling than, perhaps, any that have preceded it. I speak of the regulation of prostitution, the control of a state of things we are powerless to prevent, but which, if uncontrolled, constitutes the major cause of almost all the venereal disease, both in the army and in civil life. Statistics show that practically without exception every prostitute suffers at some period from venereal disease in one form or another, and placing at the very lowest estimate, one out of every three is tainted with syphilis. As long as human nature continues in its present state, so long will the soldier continue to indulge in promiscuous intercourse. In order, therefore, to diminish the ravages of syphilis, we must largely look to the other side of the question—namely, the control of the source of the evil—that is, prostitution. Can anything be done in this respect to render less the risk of contraction of the disease ? I venture to think that not only something, but a good deal, might be done.

One may safely start with the assumption that the Contagious Diseases Act will never again come into force without considerable modification. The chief aim to be kept before us must be to clear prostitution as much as possible from venereal disease, and this cannot be done without proper inspection and adequate treatment.

The weak, threadbare plea of the sentimentalist that ‘ the liberty of the subject ’ is interfered with falls to the ground when we remember how stringent are the rules for notification of other infectious diseases, and what careful precautions are taken to guard against the patient infecting others. The equally weak opposition of the moralist who avers that, if prostitution were freed from venereal disease, men would be encouraged to greater sexual indulgence is overcome by the fact that we cannot abolish prostitution.

In comparing the numbers admitted for venereal disease in districts near to each other—as, for example, Natal and Cape Colony or St. Helena—but in one of which some modification of the Contagious Diseases Act is carried out, while in the other no control is aimed at, it is well shown that the ratio in the former is materially less than in the latter. This fact has been noted and commented upon on more than one occasion in the official reports, and does not need repetition here. 'Secret, unwatched prostitution is far more active in spreading the disease than prostitution which is under control,' writes Lecky.

The history of the Contagious Diseases Acts and the Report of the Royal Commission on them in 1870 show what results were being obtained, so there is no need, even if there were sufficient space, to go over the subject again; suffice it to say that their efficiency was practically annulled by the resolution carried in April, 1883, 'that this House (of Commons) disapproves of the compulsory examination of women under the Contagious Diseases Acts.'

In India, by the Cantonment Act (1897), is granted 'power to compulsorily examine and detain those suspected of suffering from contagious and other diseases.' Since so large a percentage of prostitutes contract venereal disease, they are all more or less suspected of suffering from such disease, and the wording of the Act covers, or should be made to cover, this.

A wise Government has framed laws to protect workers in factories from danger and accident, and the general public from contraction of infectious disease, by compulsory notification, and in some cases isolation; why, then, should it allow this pestilence that walketh in darkness to work its ravages uncontrolled? It is our duty to do our utmost to minimize the harm that arises from this evil; it is our duty, from the medical and military points of view, as it is the duty of the State, as guardians of the public health, to exercise careful supervision over an evil it cannot repress.

The first step towards this end would be the forbidding of public solicitation by prostitutes, so that men would have to go and seek for what they want, and if they contracted the disease, would be able to know exactly where they caught the infection.

The next step would be the registration of prostitutes.

This would be difficult in the case of the civil population, for there would be all the obstinacy of a clamorous and weak-minded section of the public 'to be met and fought with outright'; but with these it is not for us to deal. As regards the army, the difficulty would be far less, the soldier only being allowed to visit those whose names were on the local garrison register.

Thirdly, only the names of those should be allowed on this list who are willing to submit to regular examination. The women themselves would not be nearly so averse to this as many people think if the examinations were carried out by properly appointed medical men at a hospital, and not at the local police station; for this very fact, though in reality of minor importance, would naturally be regarded by them as a slight, and means would assuredly be tried to evade examination. Any who failed to present themselves would be warned, and if they persisted in their refusal, their names should be erased from the list. I maintain, however, that few would refuse, for they would see clearly that the measure was for their good, that they would receive early and thorough treatment (*vide infra*) if affected, and could ply their calling if well without danger to others.

Next, in all garrison towns there should be a small hospital for women under military rule, where the women could present themselves for inspection, and where they would be admitted for treatment if such were found necessary. There, too, they must be kept until cured—at least, till all signs of disease have disappeared; or, if the case be serious, the patient may be discharged to a civil hospital, and her name struck off the register.

It is important to bear in mind that women so admitted must be treated with kindness and consideration. Who shows more indignation than a thief whose honesty is called in question? So if these women be regarded as outcasts, they will of a surety find some means to evade the examination, either by trying to conceal the disease or by getting other women to come up in their place; whereas if the above plan were followed and the patients kindly treated, they would see that it was to their interests to go to hospital, and they would do so without compunction.

The objectionable points of the system, which tend to bring Acts like the Contagious Diseases Acts into disfavour, are absent, it will be noticed, from the plan I have sketched above. All idea of persecuting and hunting down the prostitute must be set aside from the outset. Let there be no dogging the footsteps of these women to track them home, no laws forcing them to wear special dress to make them conspicuous. Regulations must be made easy for them to obey, and obedience will come spontaneously on their part.

Opposition would probably still be very strong amongst the general public (not so much among the women themselves), but the public probably do not realize one tithe of the misery, agony, and despair wrought by this terrible scourge. Could their ignorance but be enlightened, they could not fail to see that some such scheme as that laid down above would do much, very much, towards mitigation of an evil which probably no amount of legislation could abolish.

THE END

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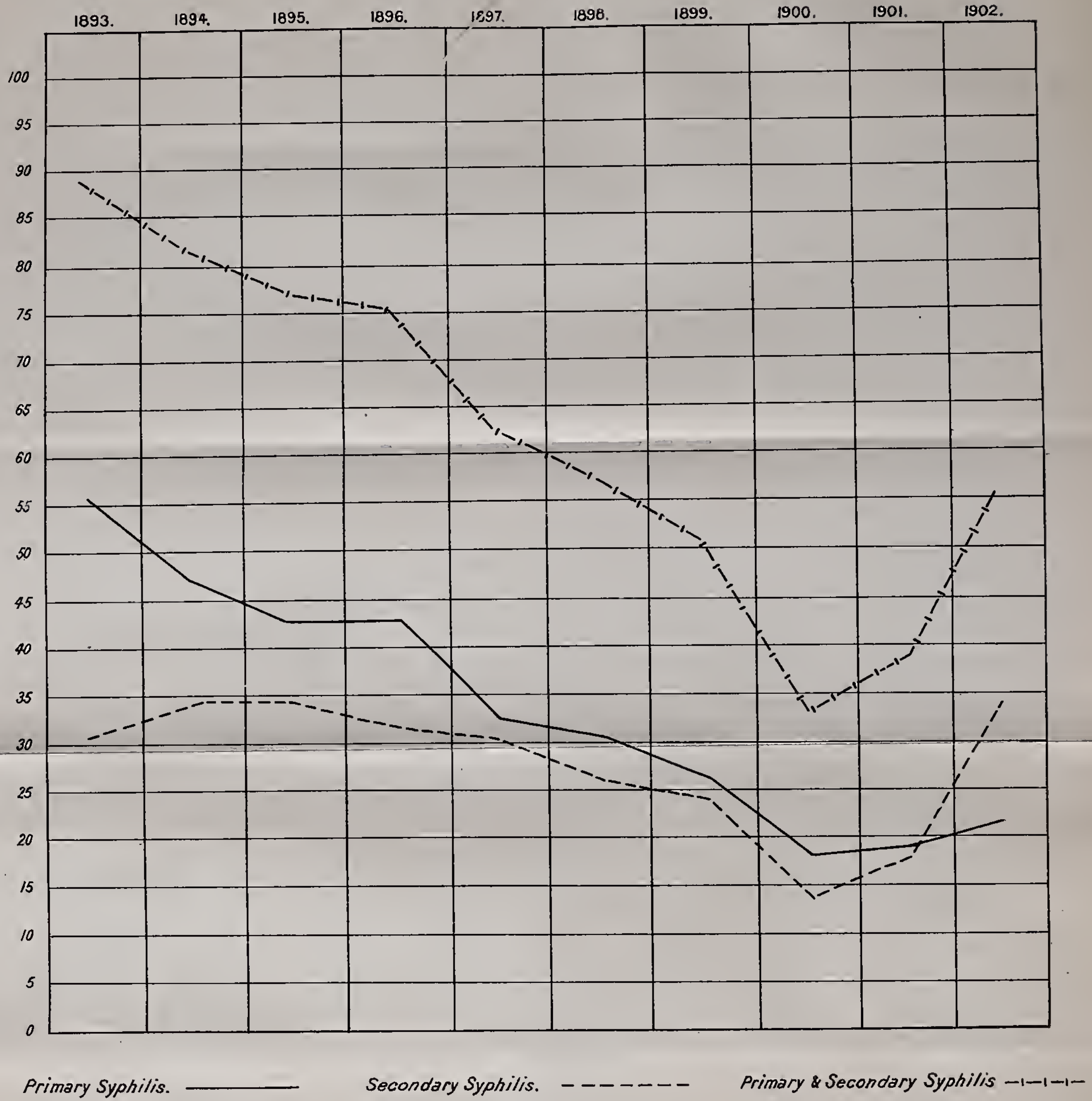

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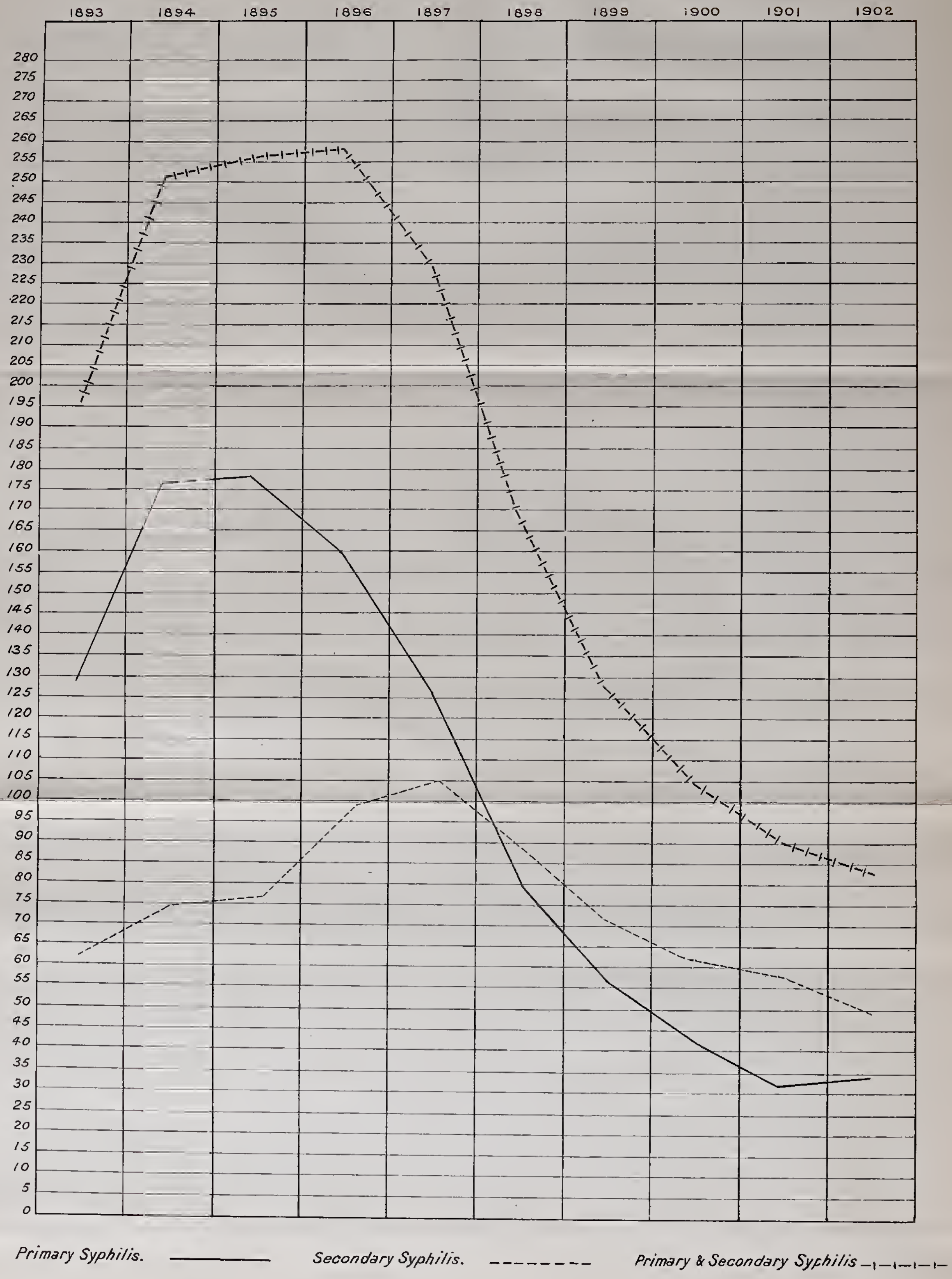

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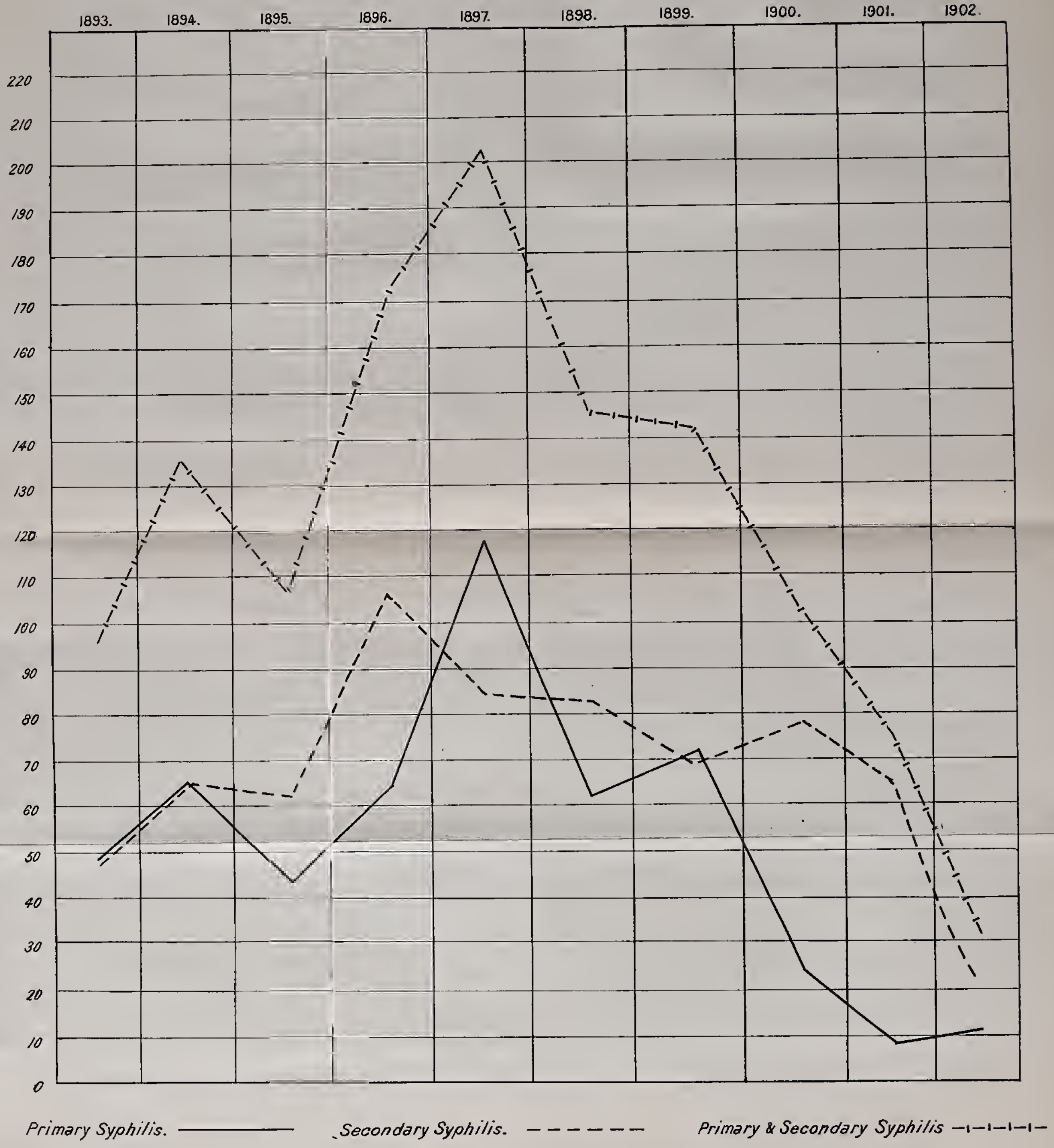

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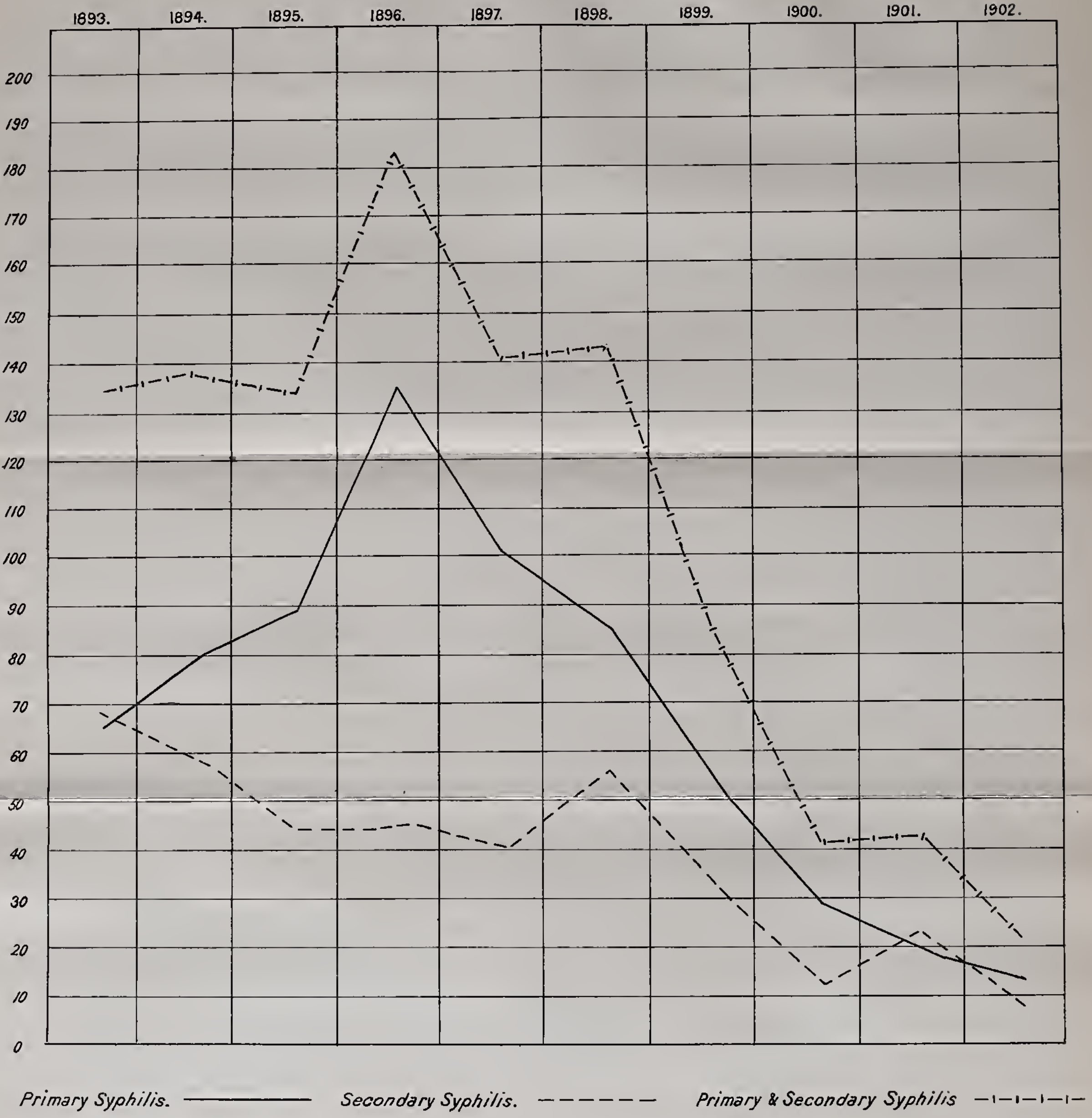

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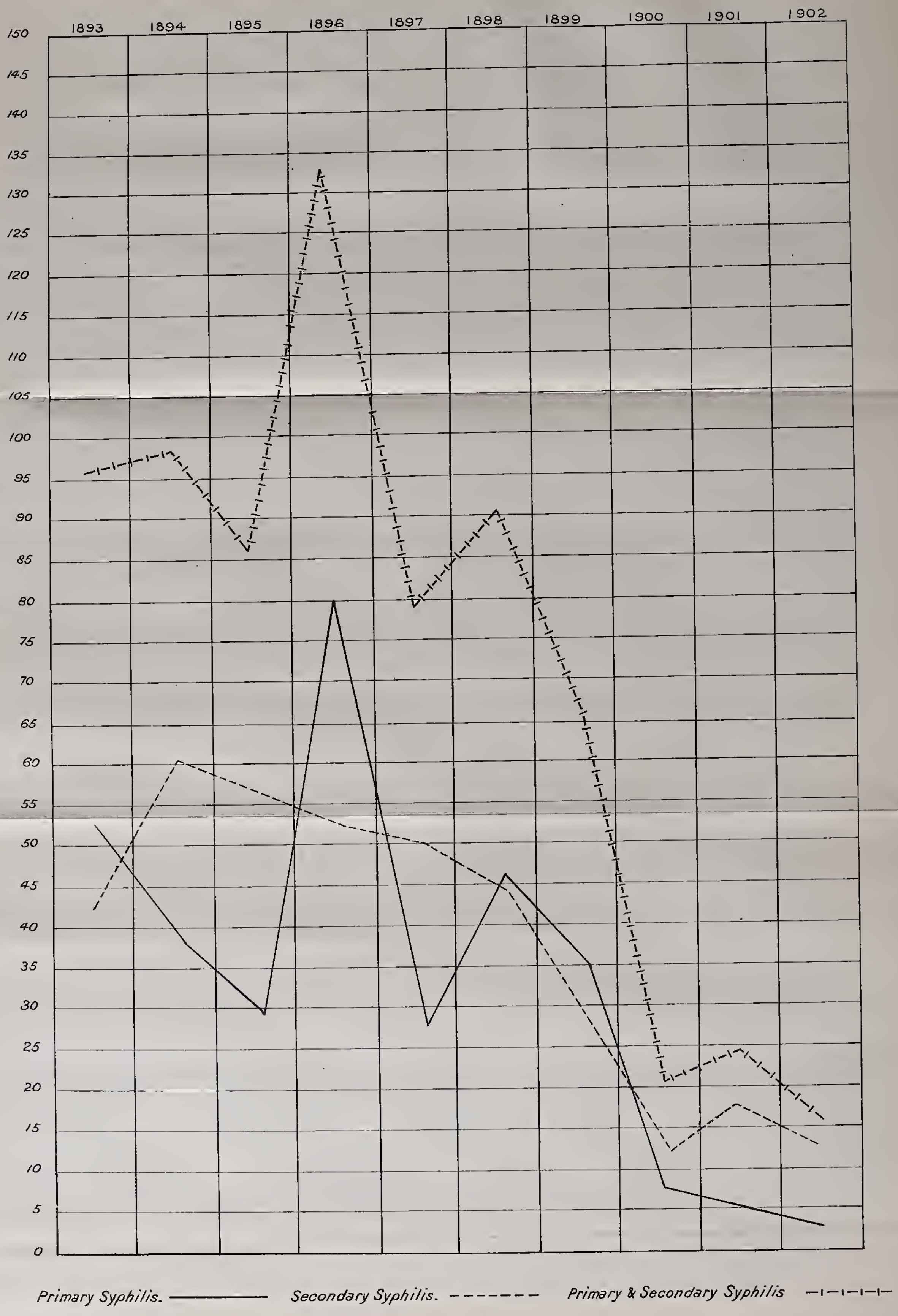

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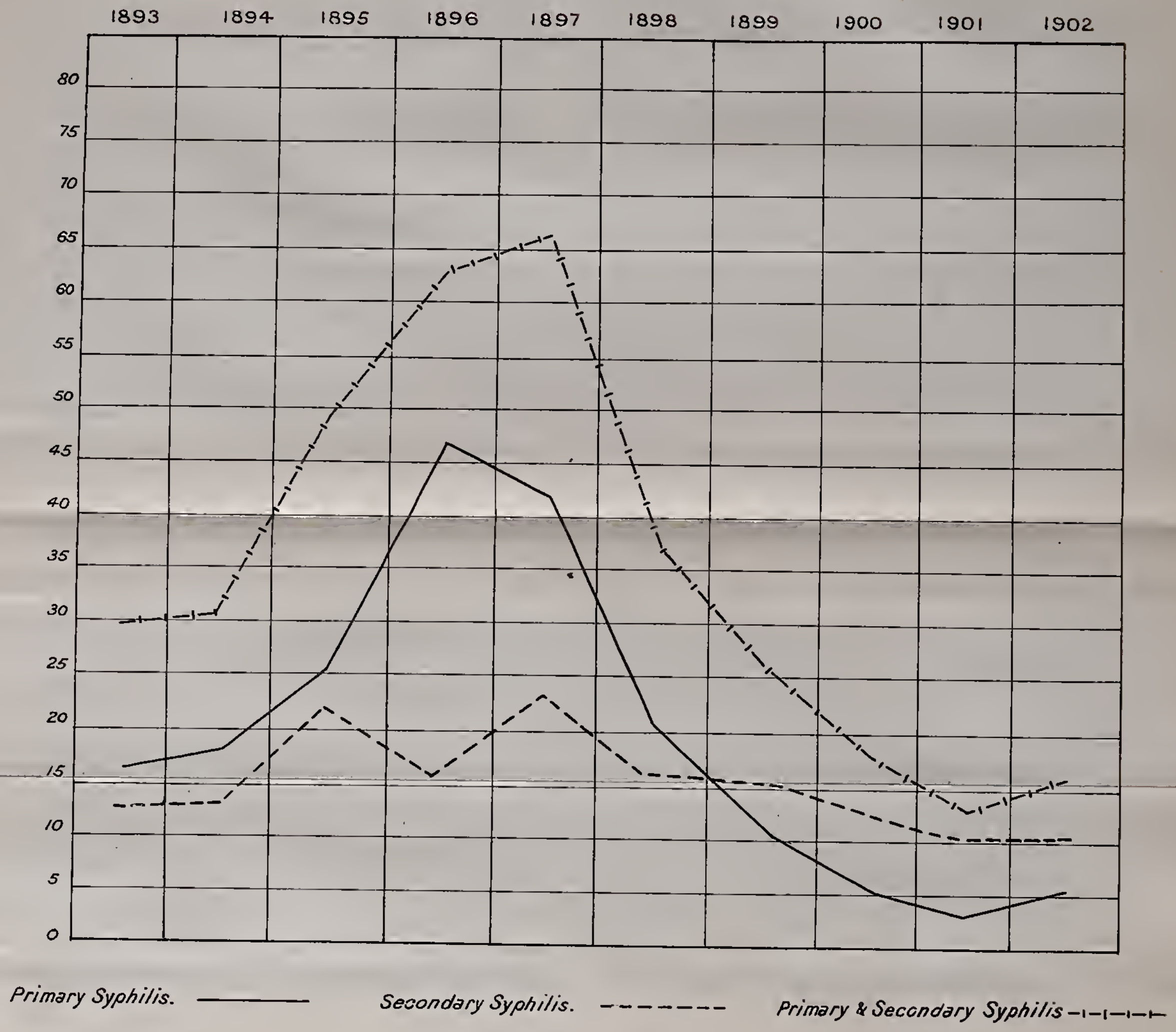

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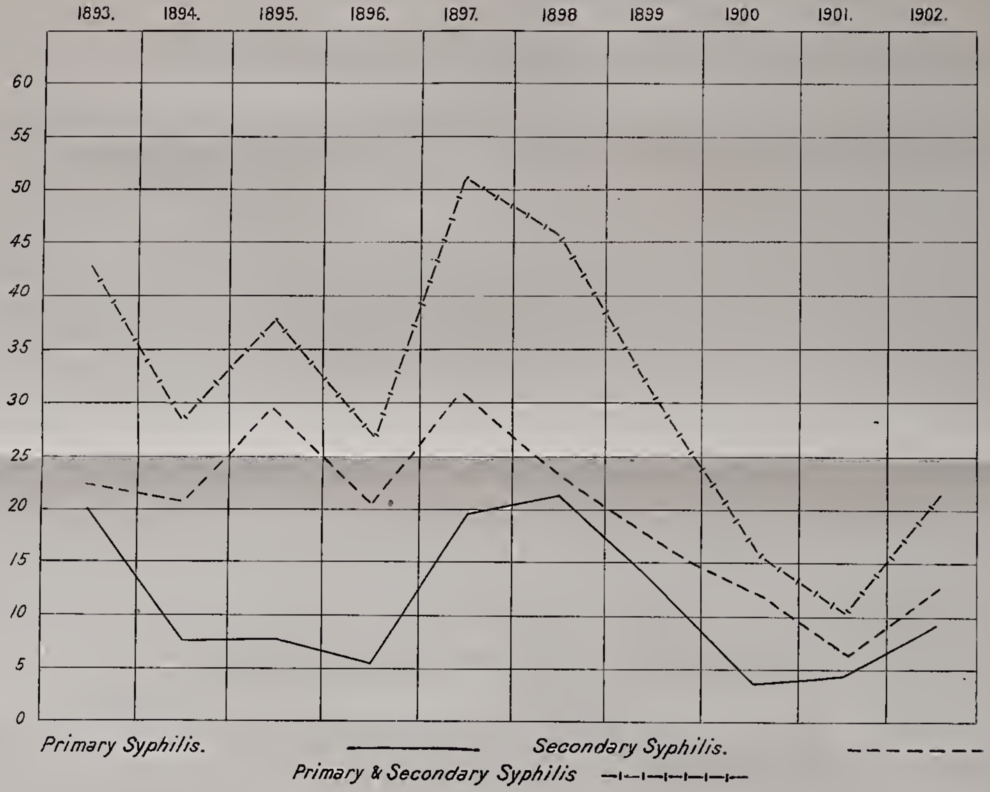

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Ratio of Constantly Sick.

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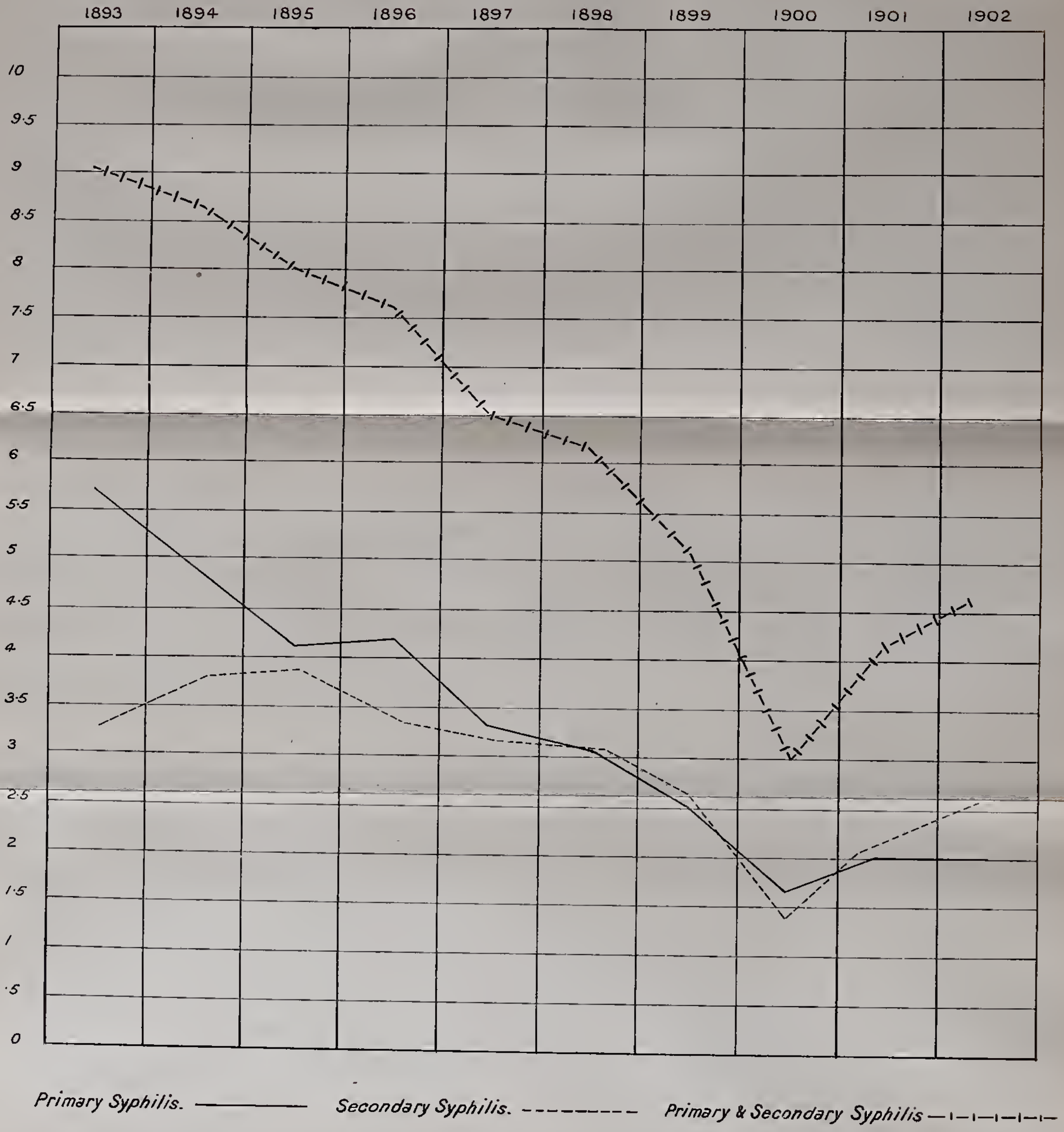

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RATIO OF CONSTANTLY SICK.

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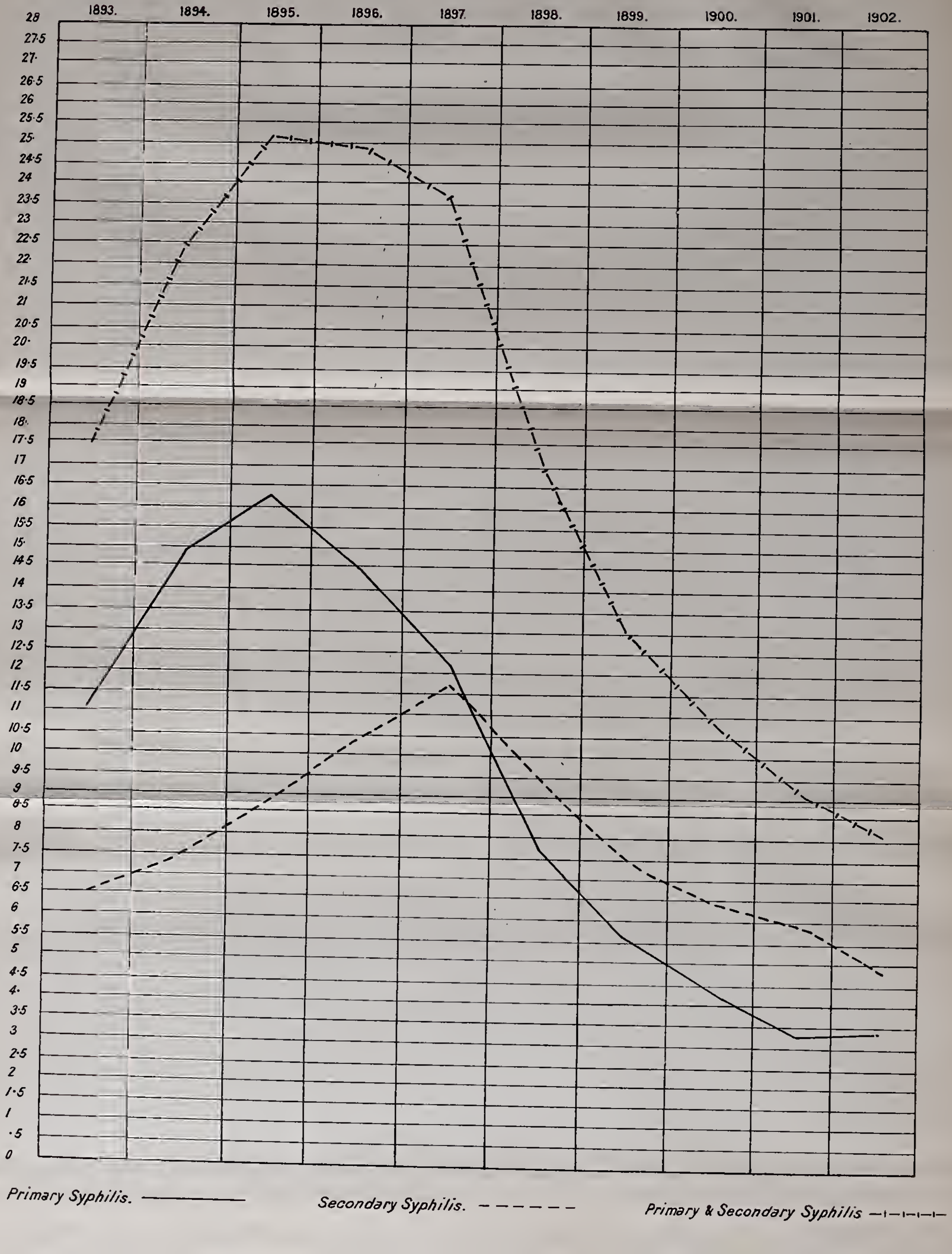

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CHINA.

RATIO OF CONSTANTLY SICK

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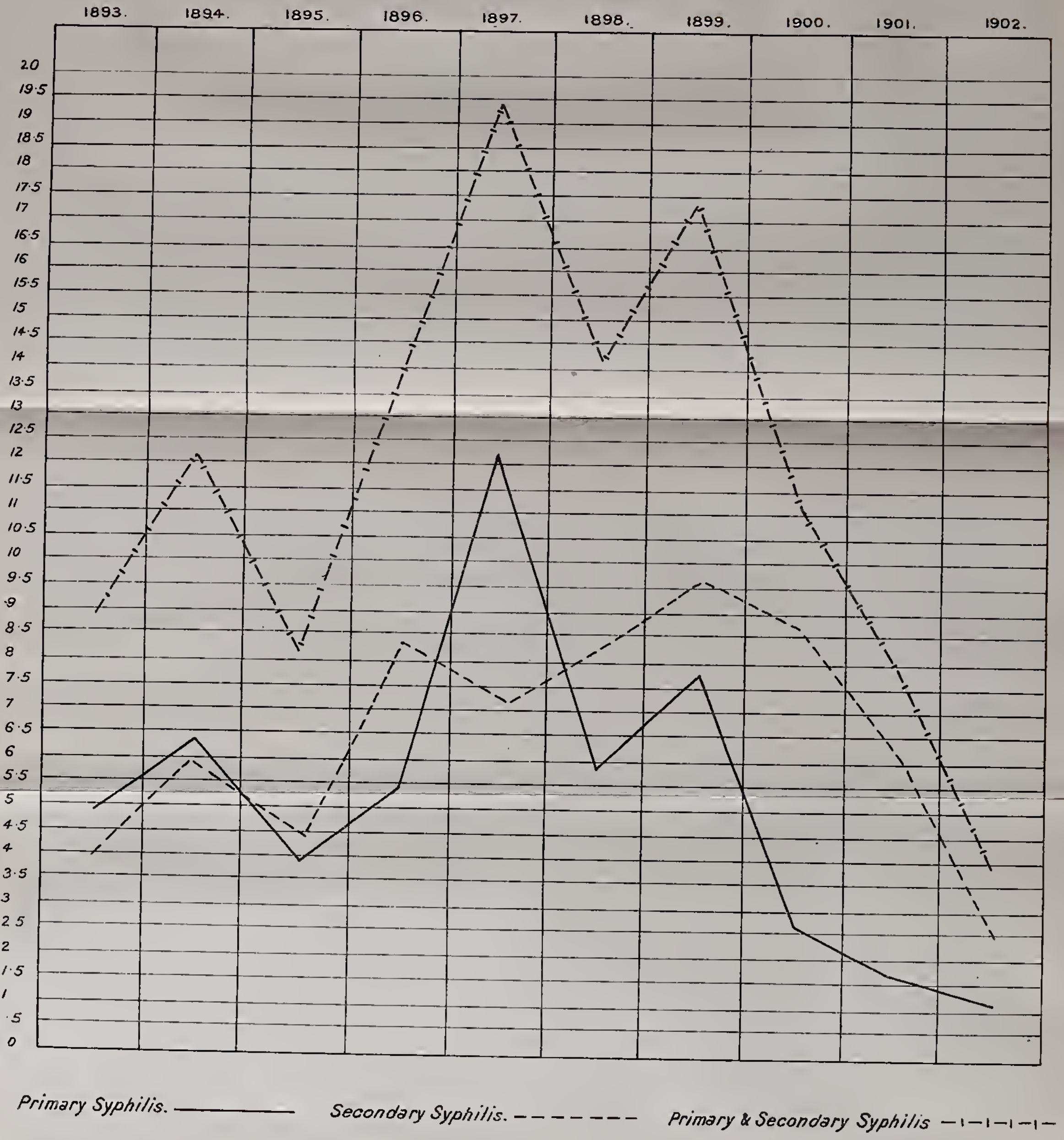

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RATIO OF CONSTANTLY SICK.

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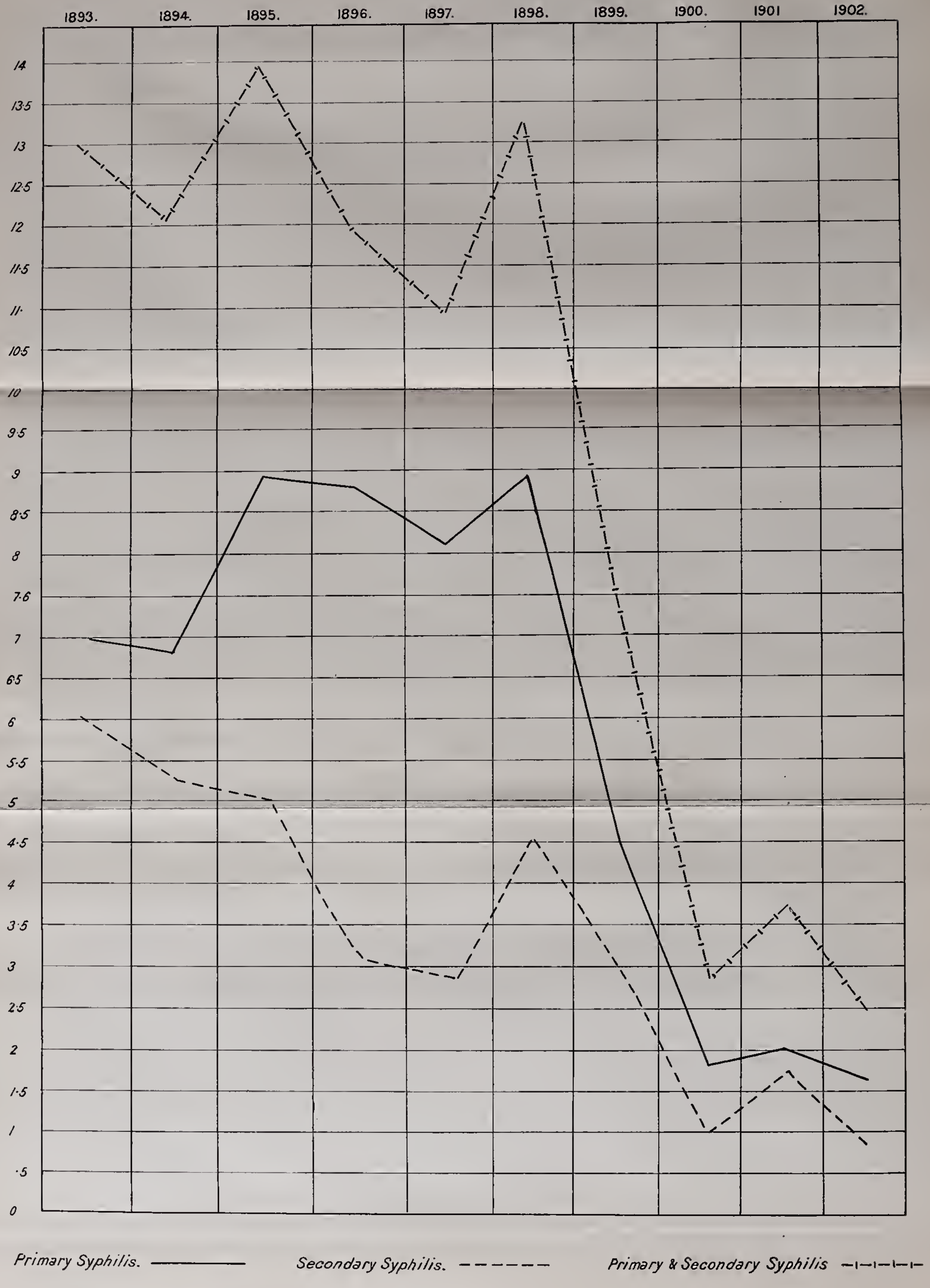

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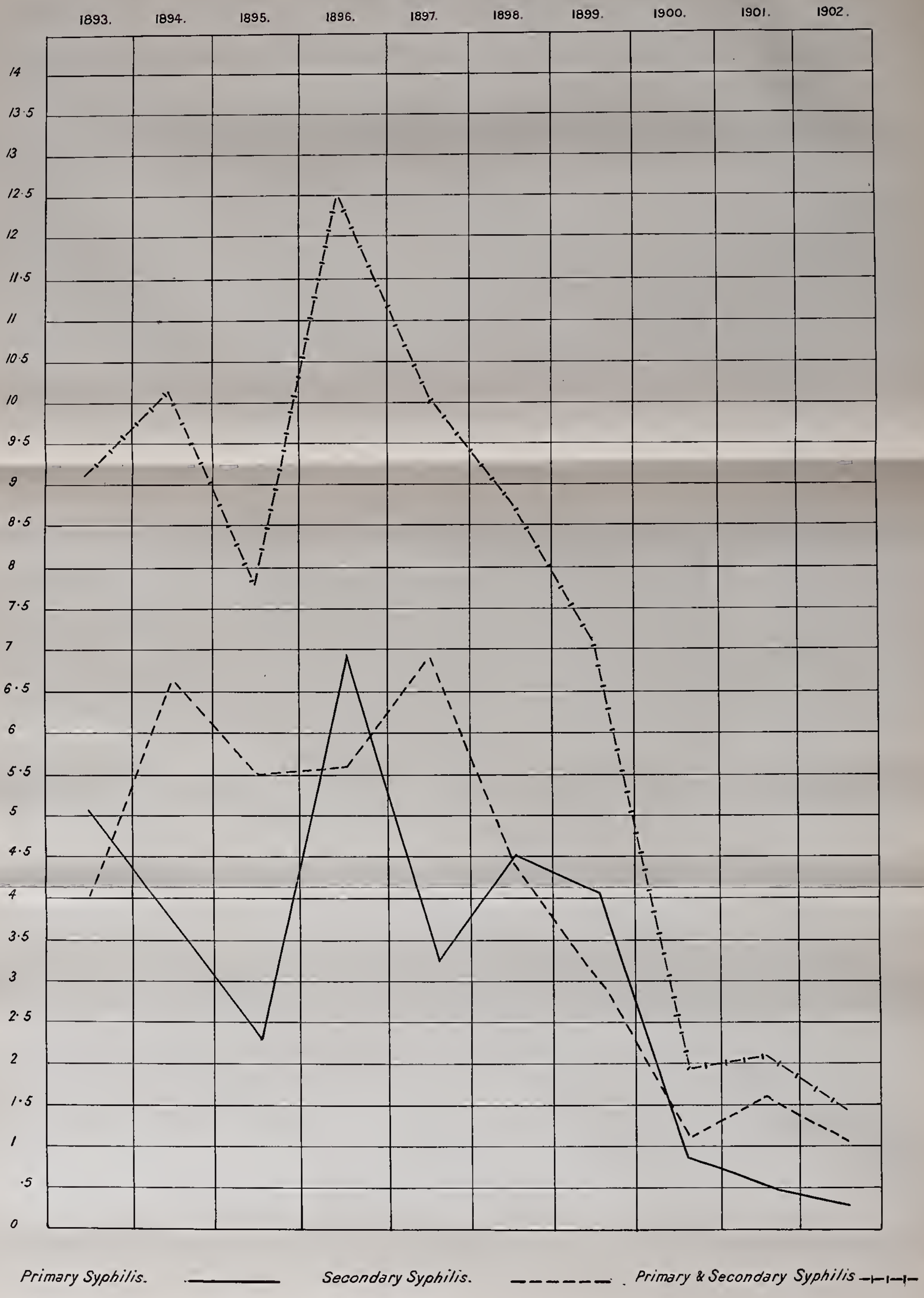

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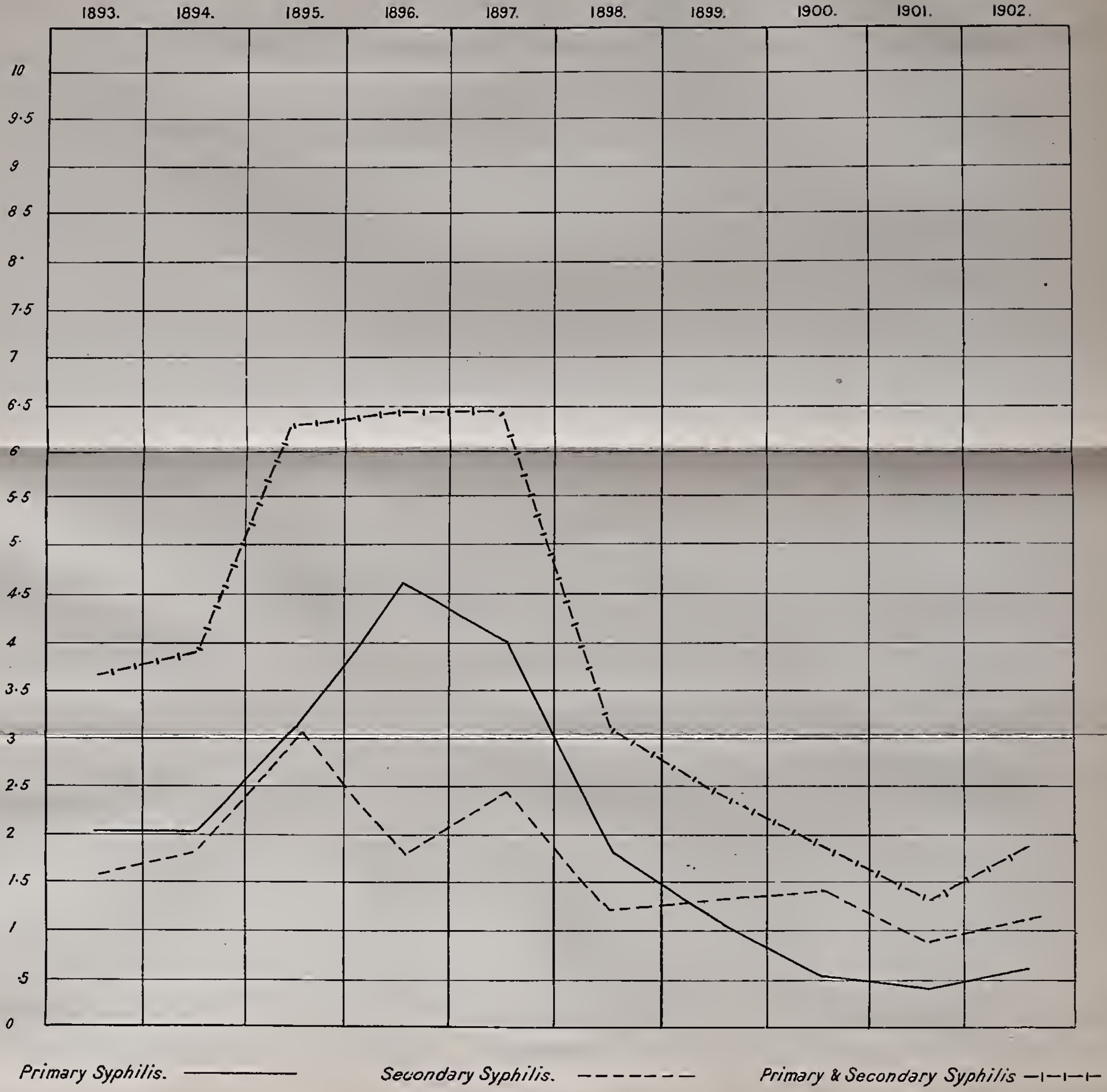

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Ratio of Constantly Sick.

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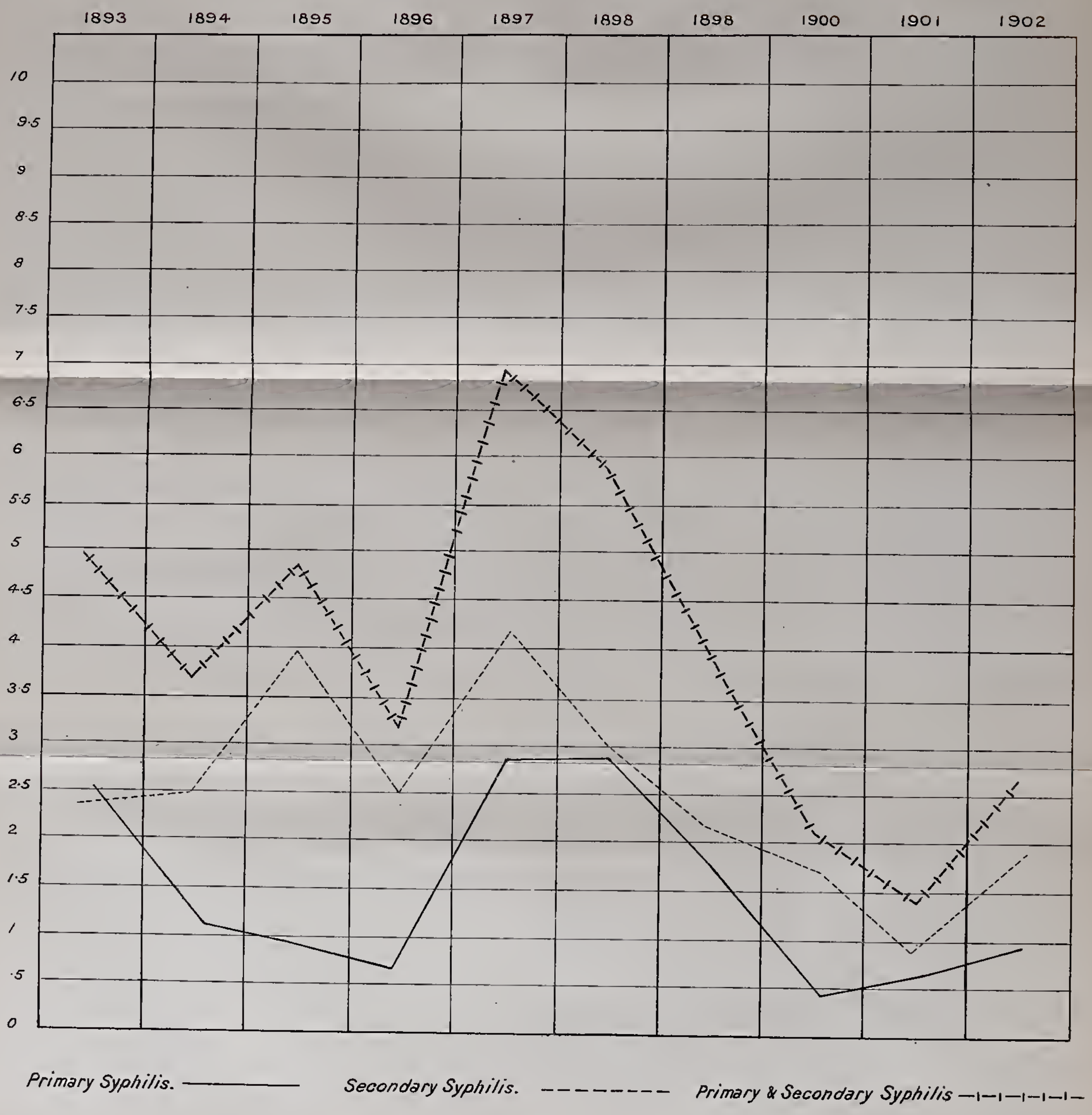

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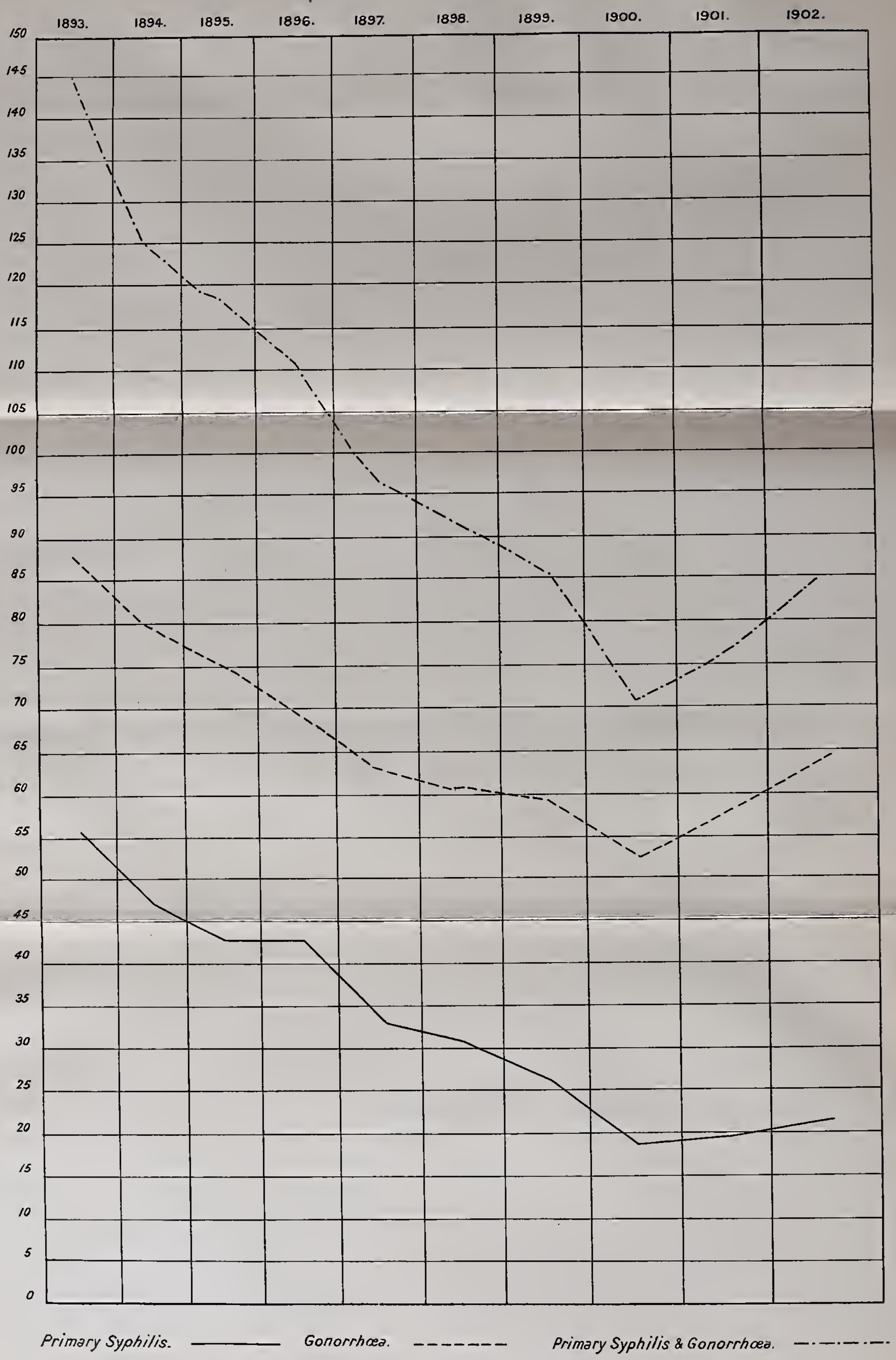

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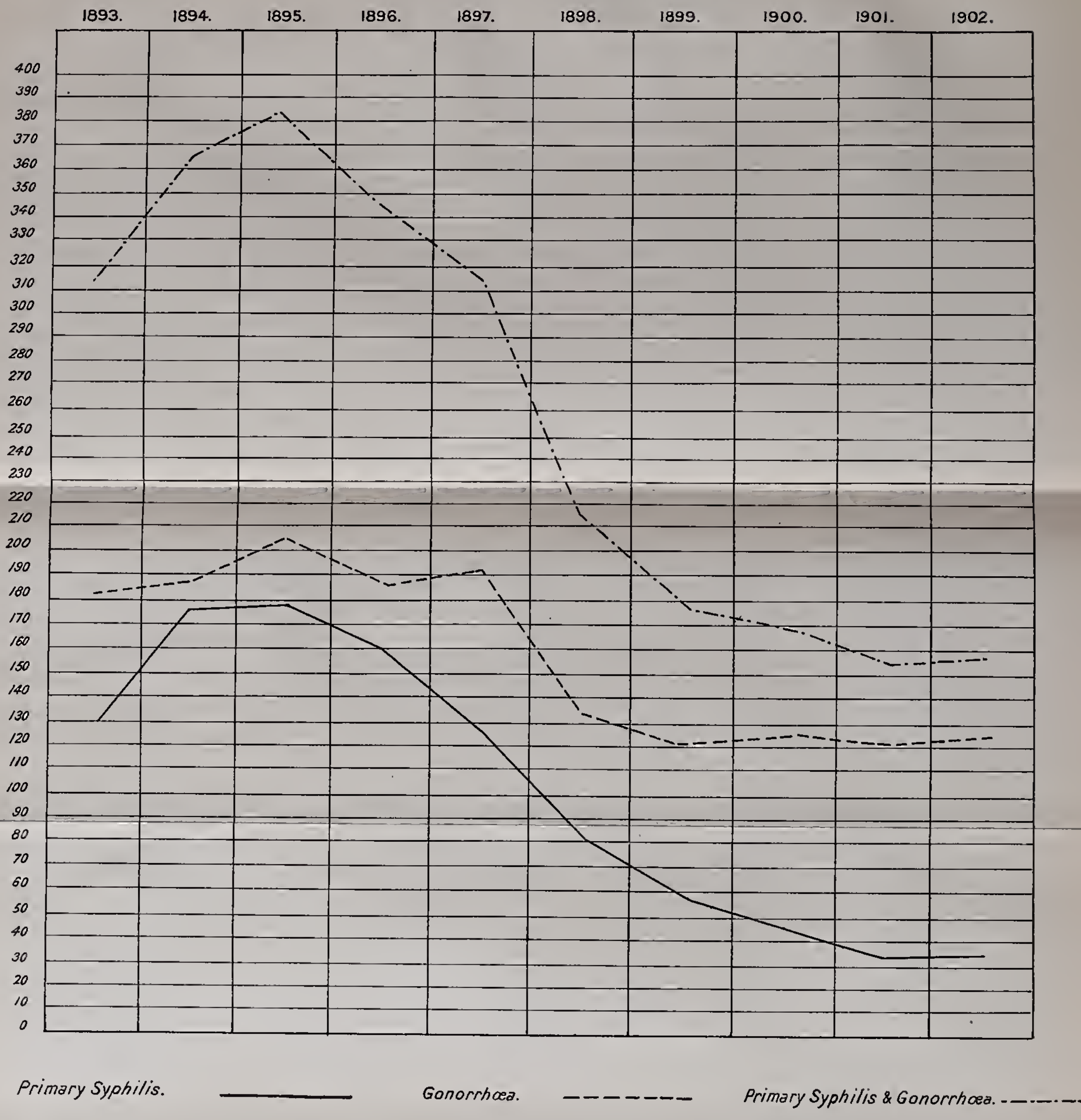

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CHINA

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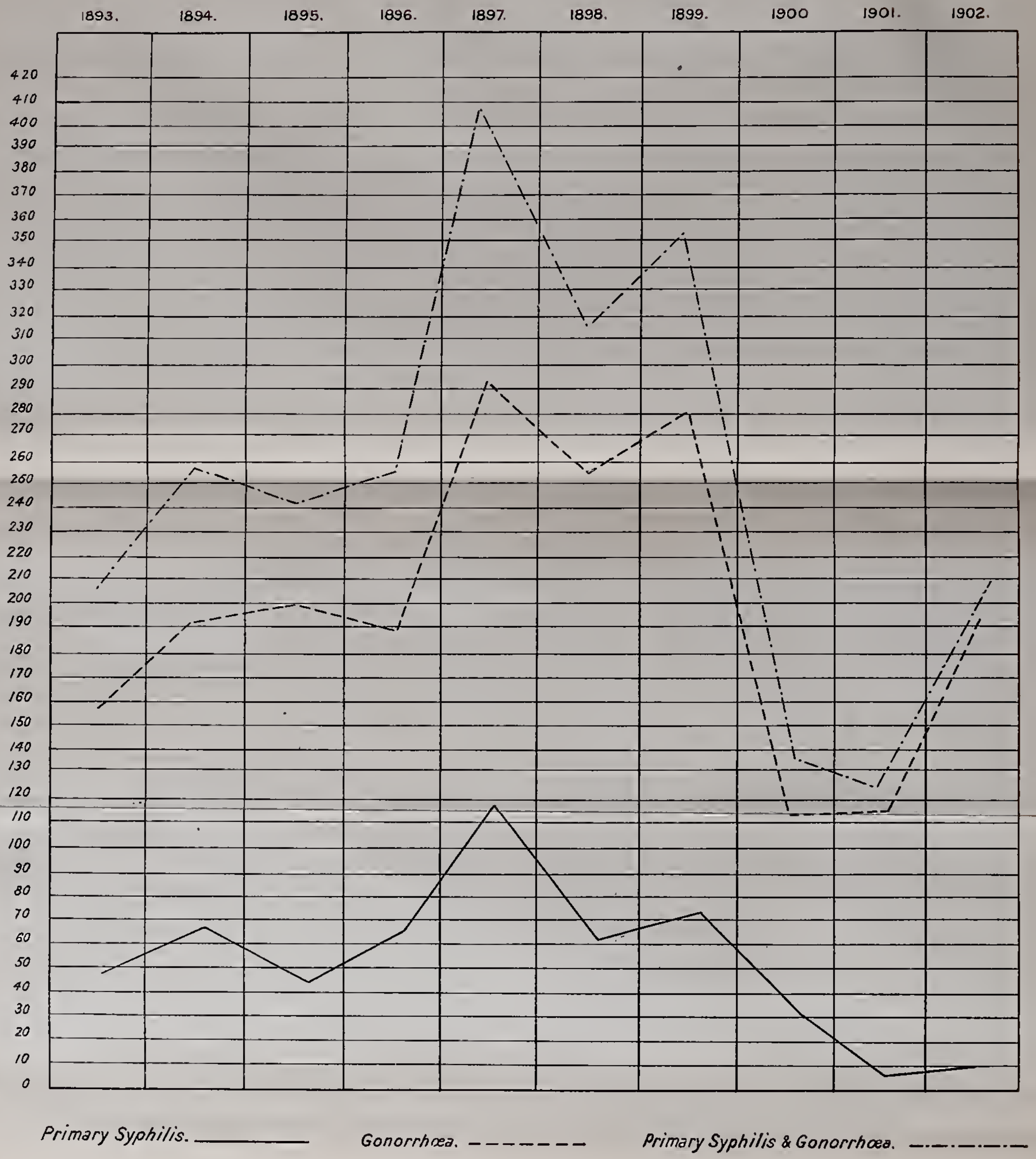
PRIMARY SYPHILIS & GONORRHŒA



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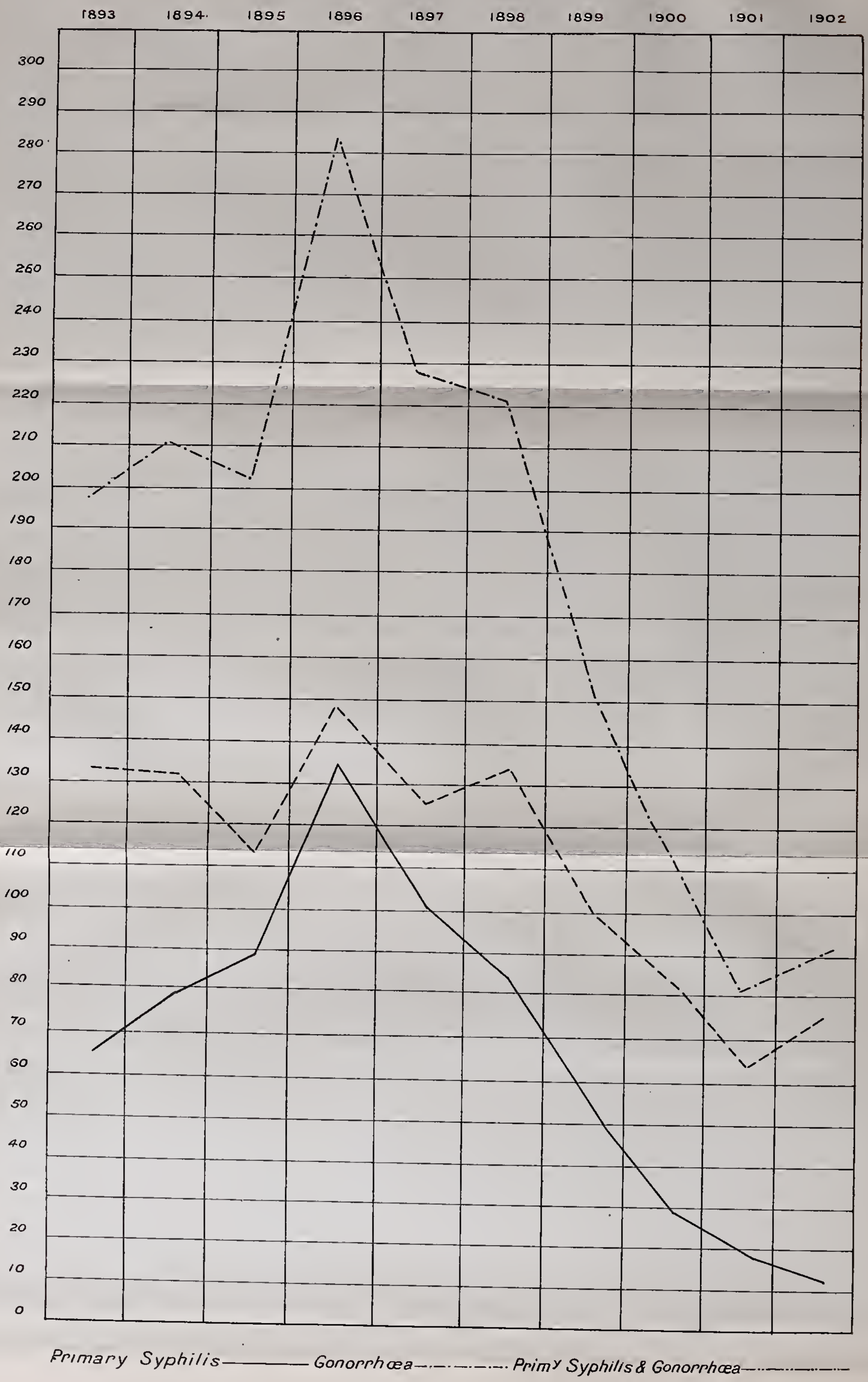
Primary Syphilis & Gonorrhœa.



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EGYPT AND CYPRUS.

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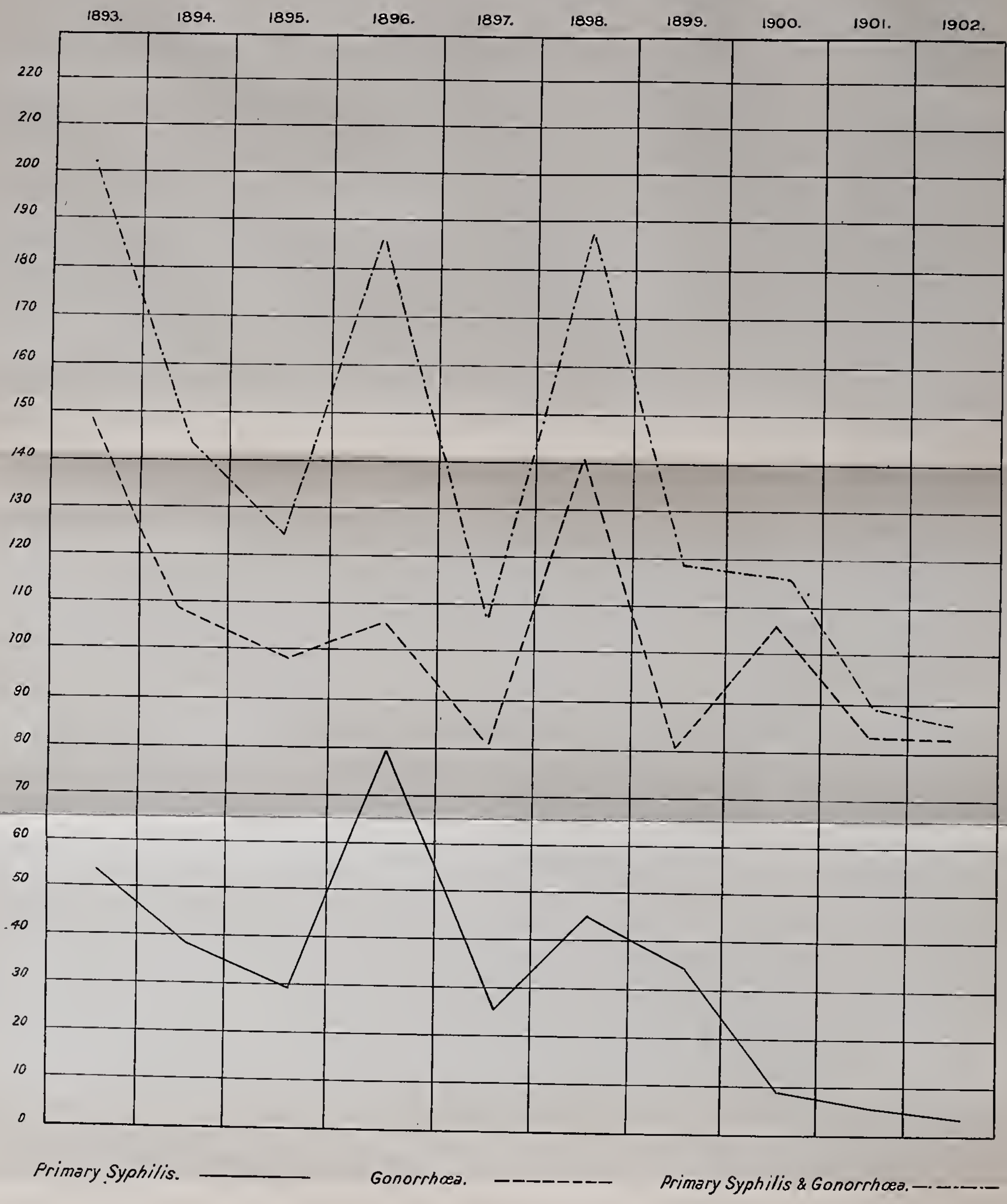
PRIMARY SYPHILIS & GONORRHŒA.



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MALTA.

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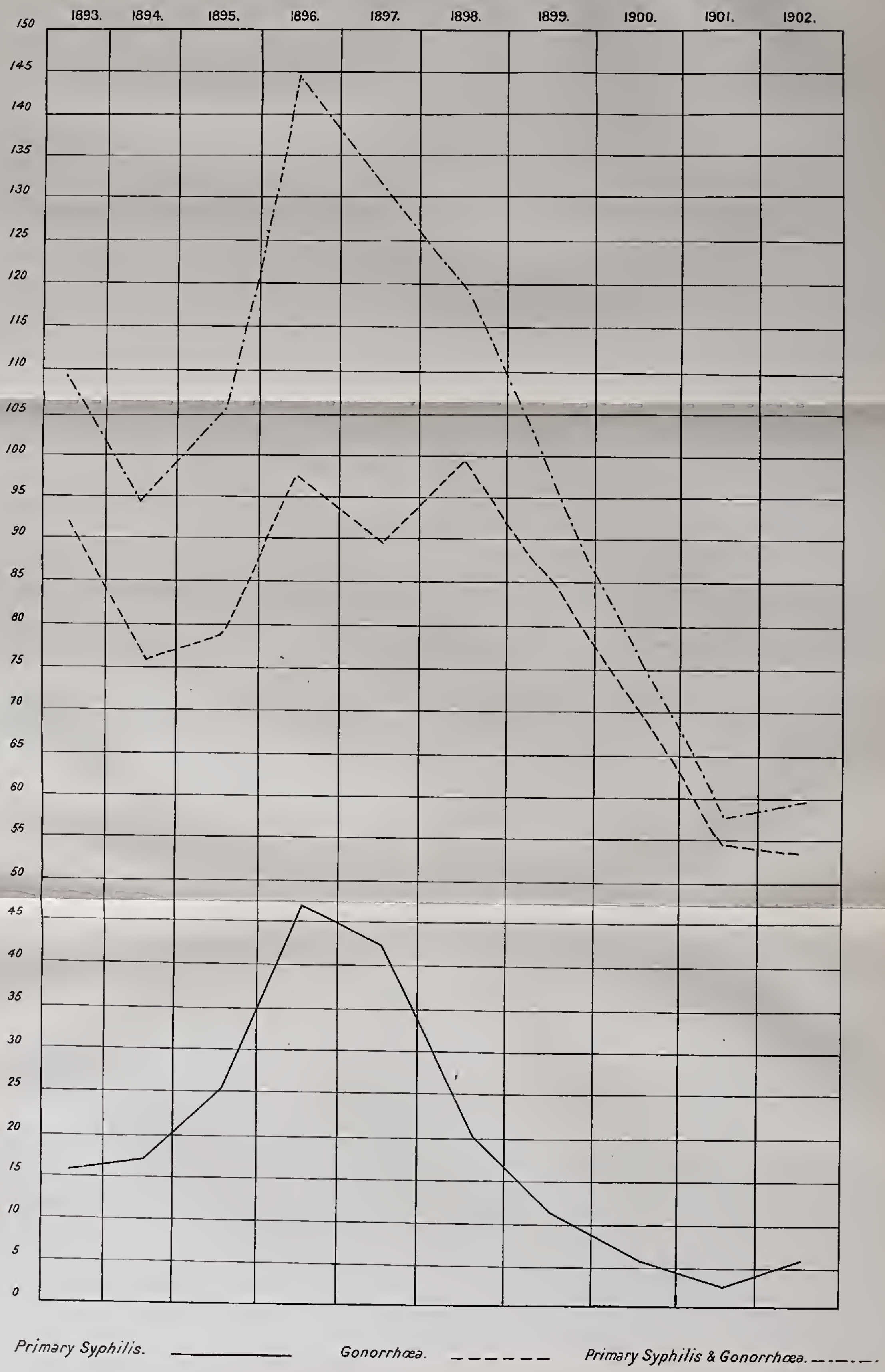
PRIMARY SYPHILIS & GONORRHŒA



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GIBRALTAR.

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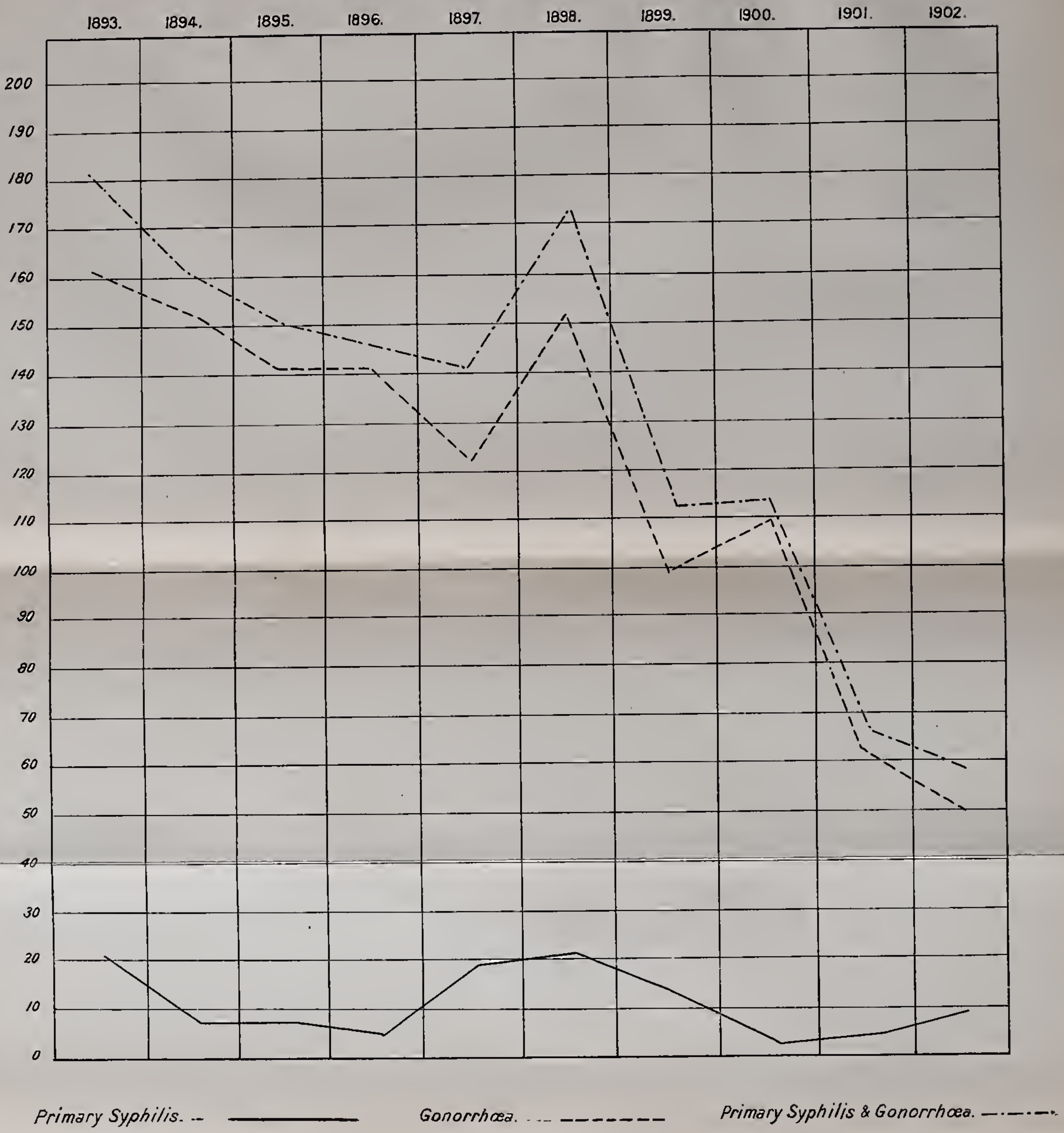
PRIMARY SYPHILIS & GONORRHŒA



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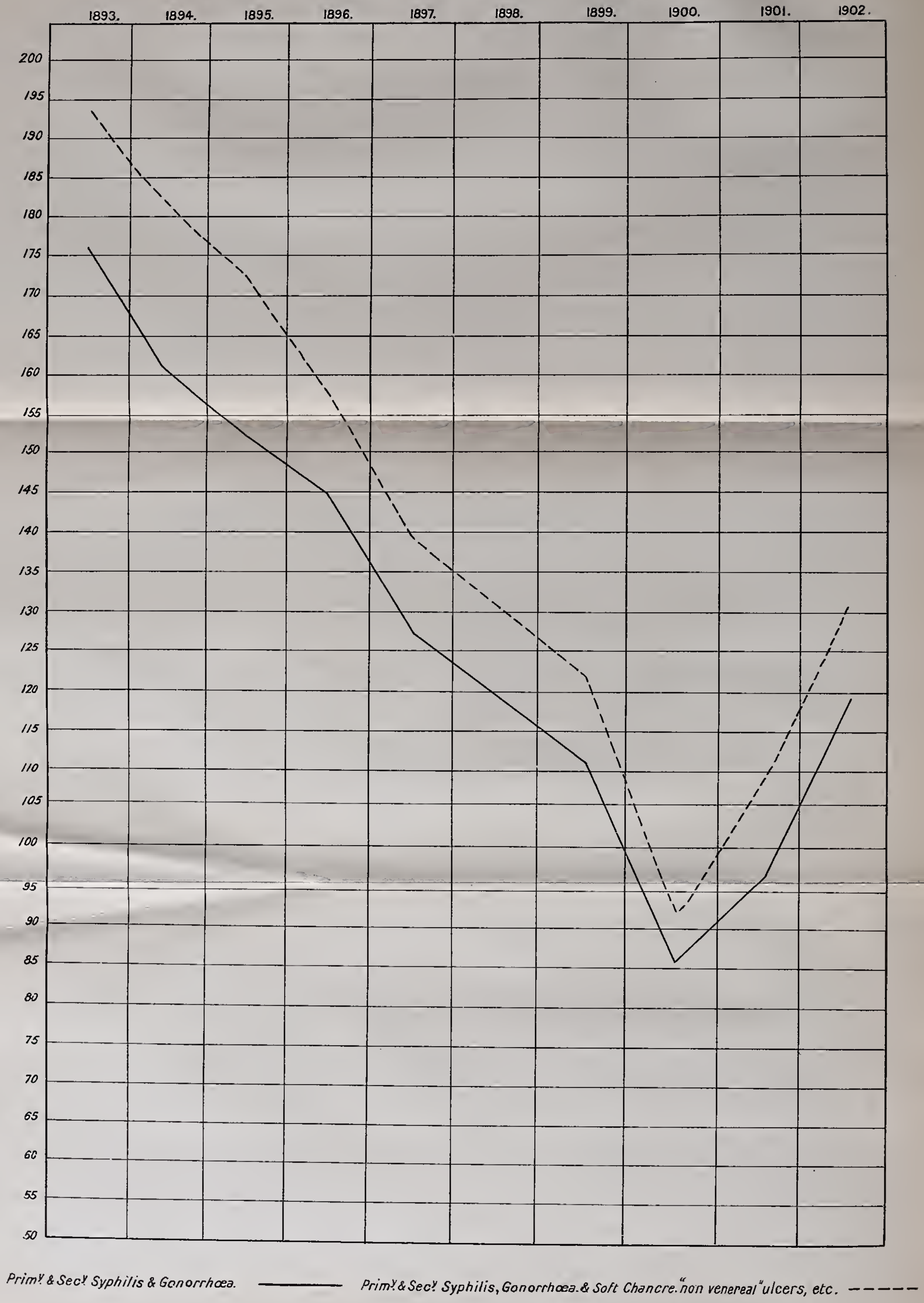

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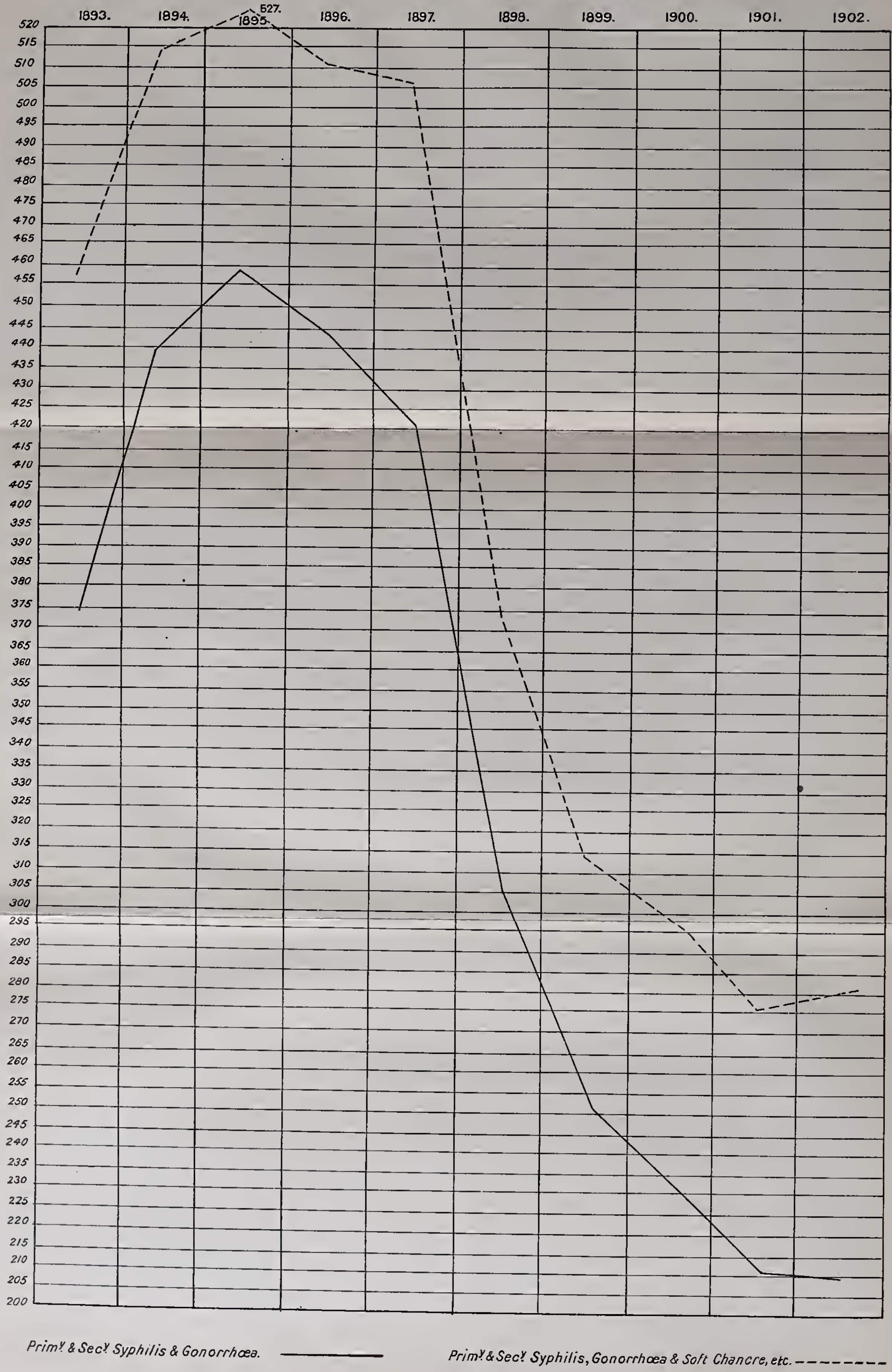

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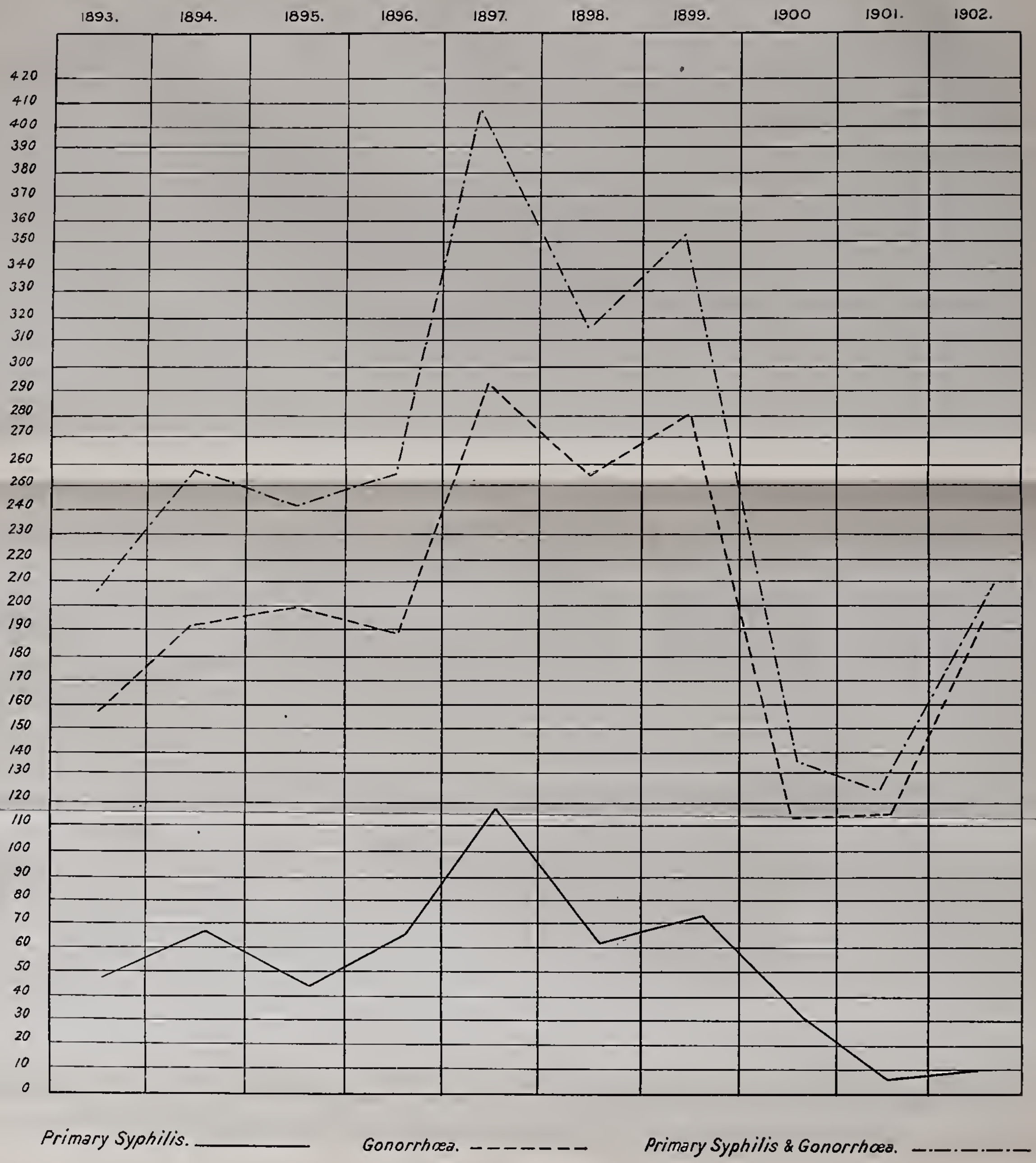
CHINA

ADMISSION RATIO.

PRIMARY SYPHILIS & GONORRHŒA



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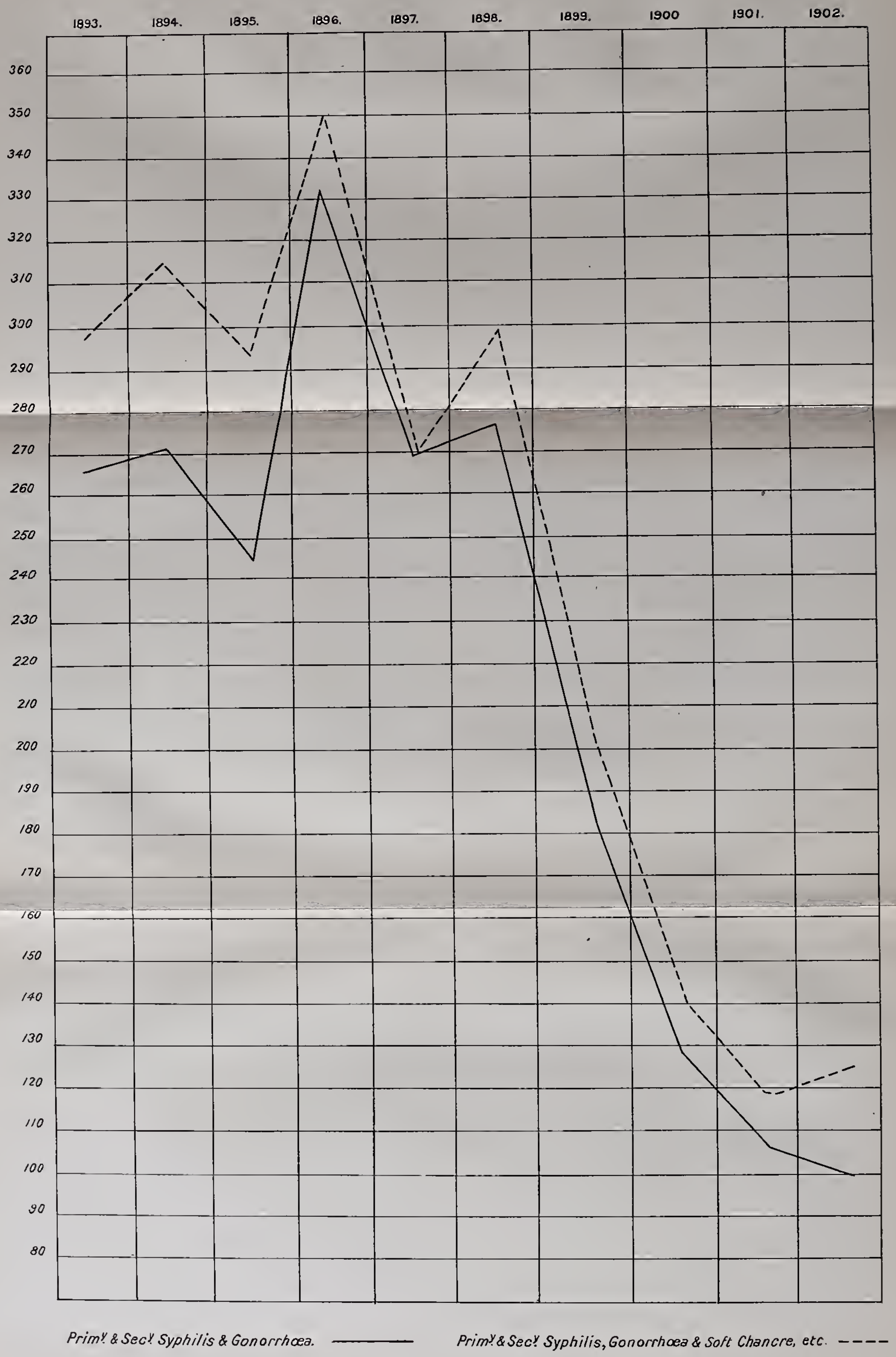

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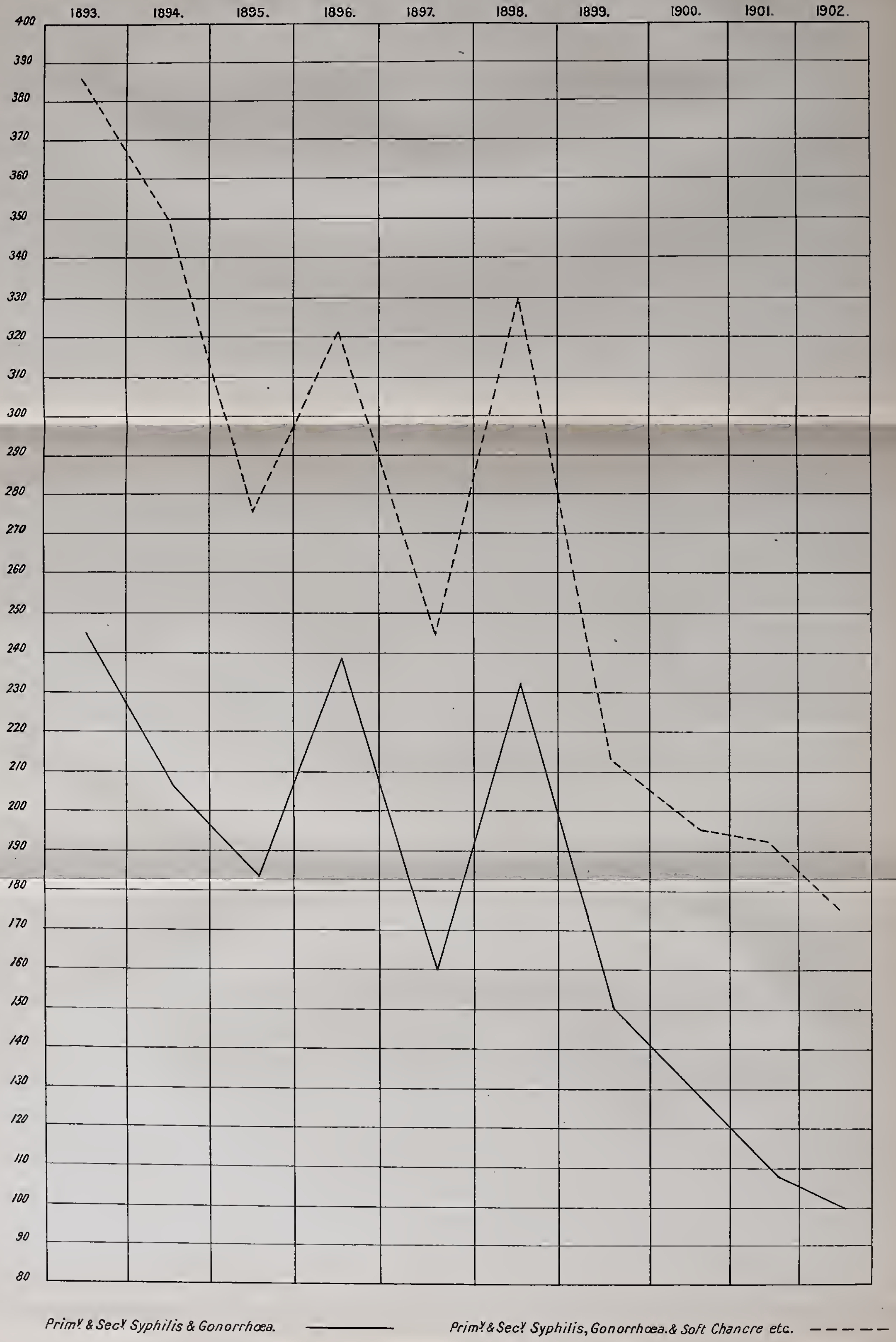

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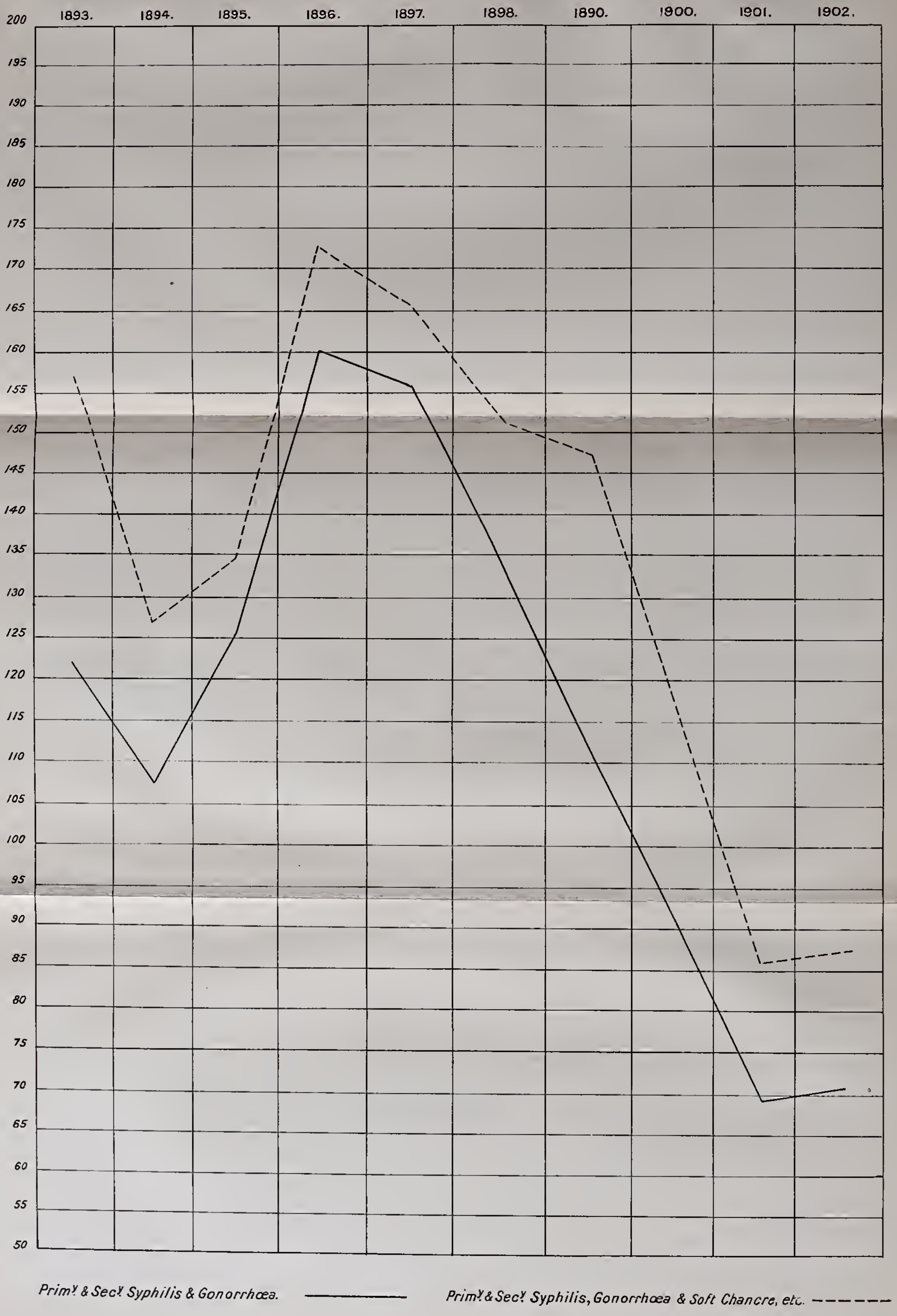

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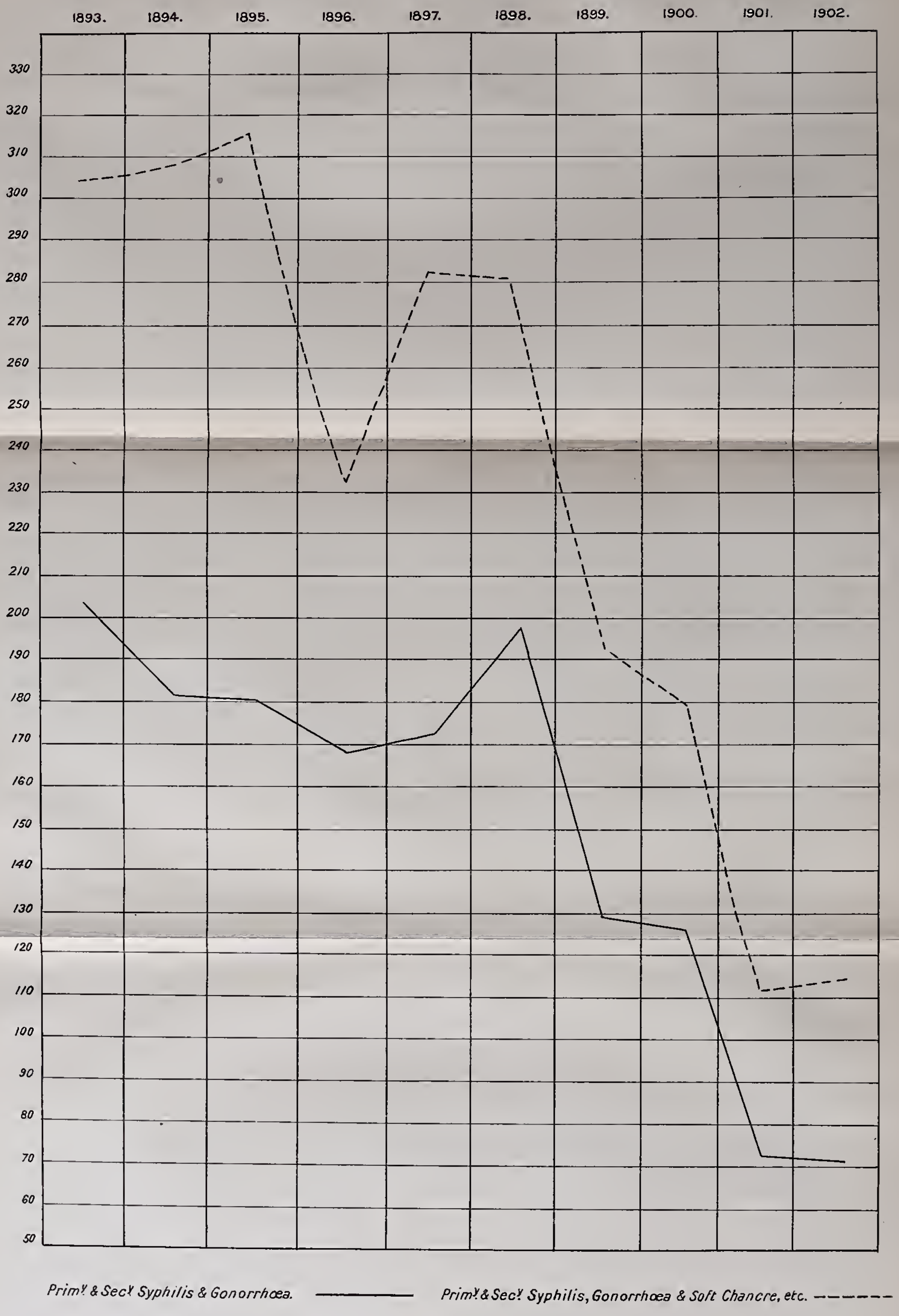

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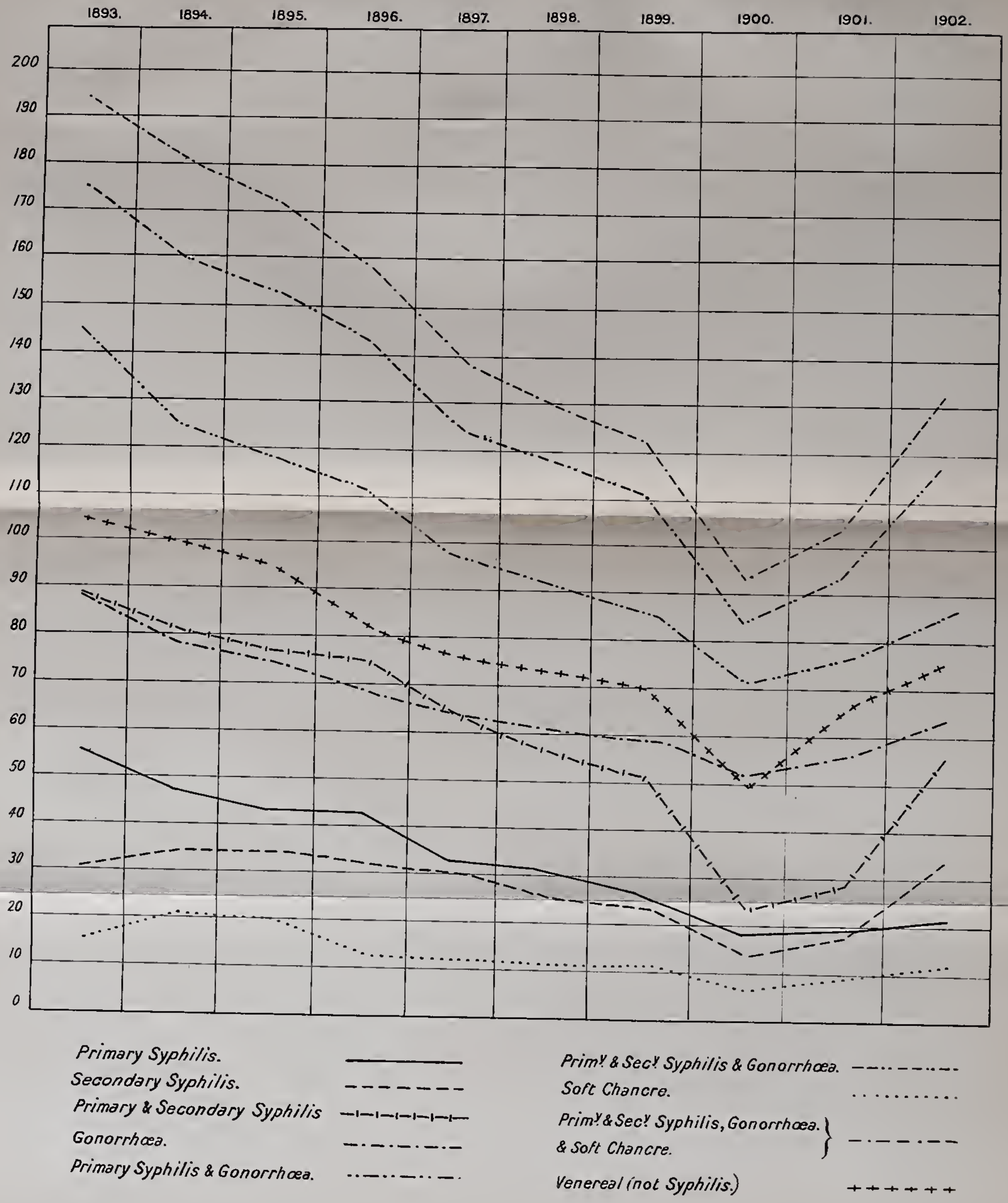
GENERAL VENEREAL TABLE _ ADMISSION RATIO



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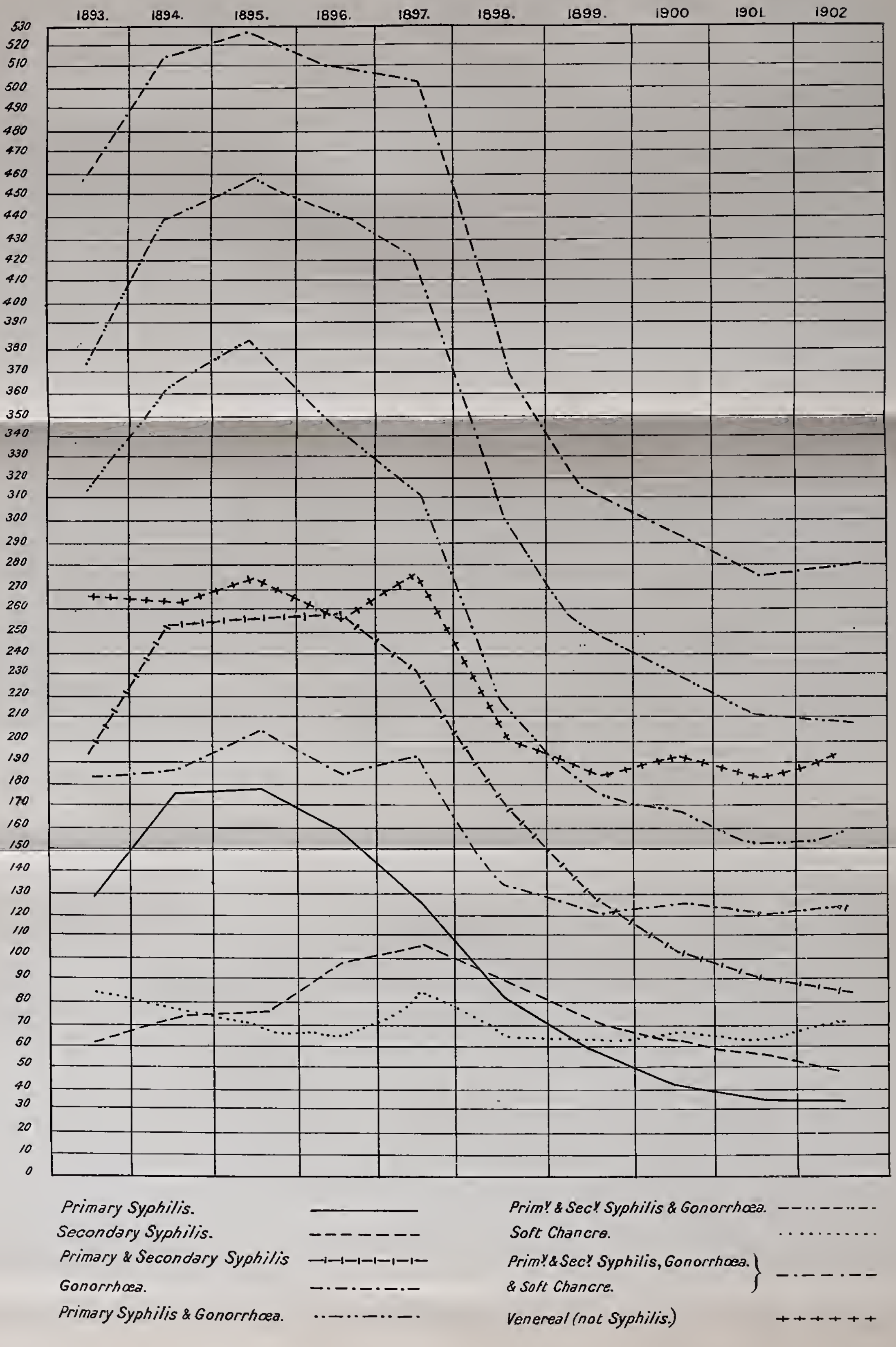

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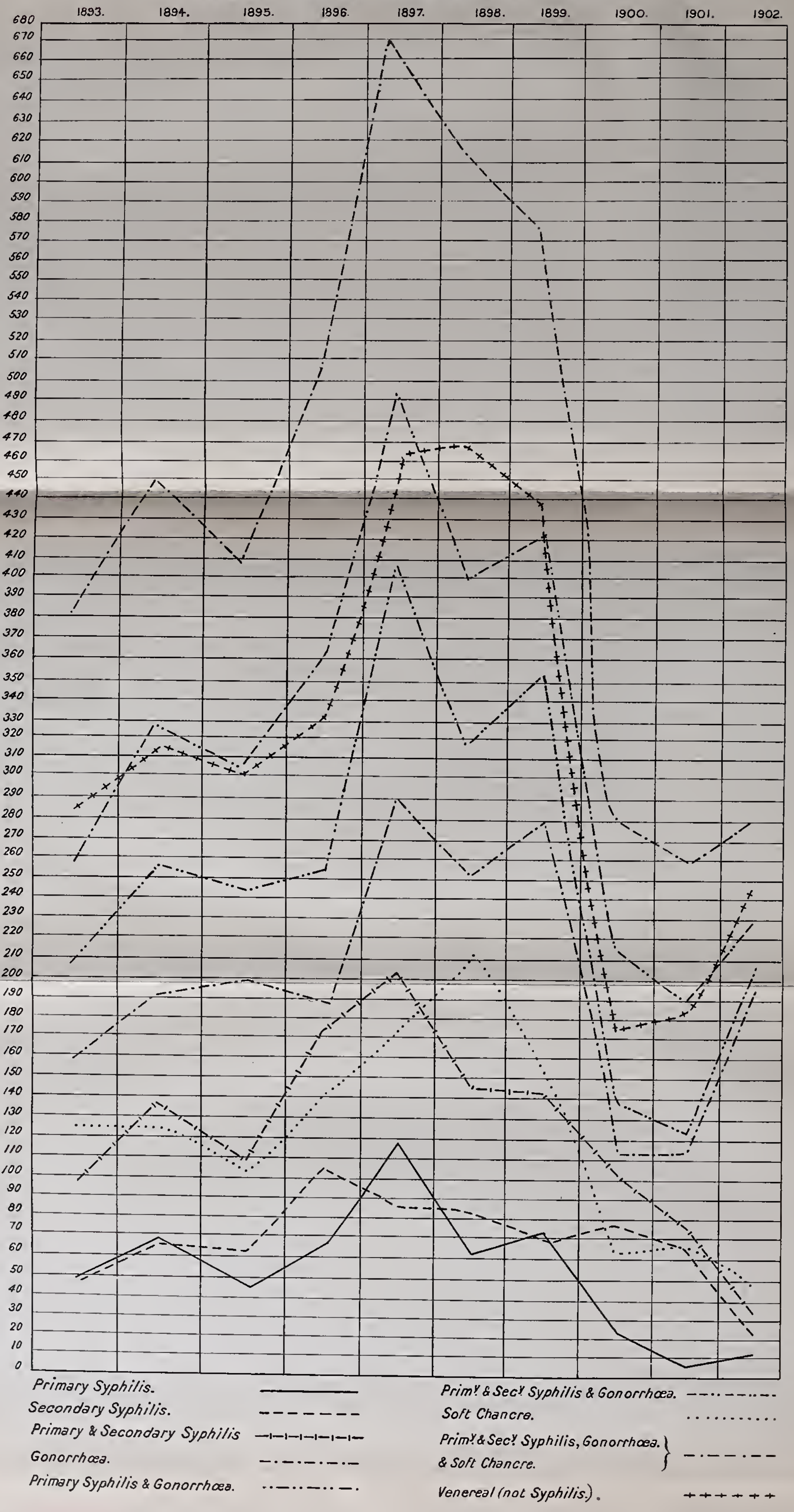
CHINA.

General Venereal Table _ Admission Ratio



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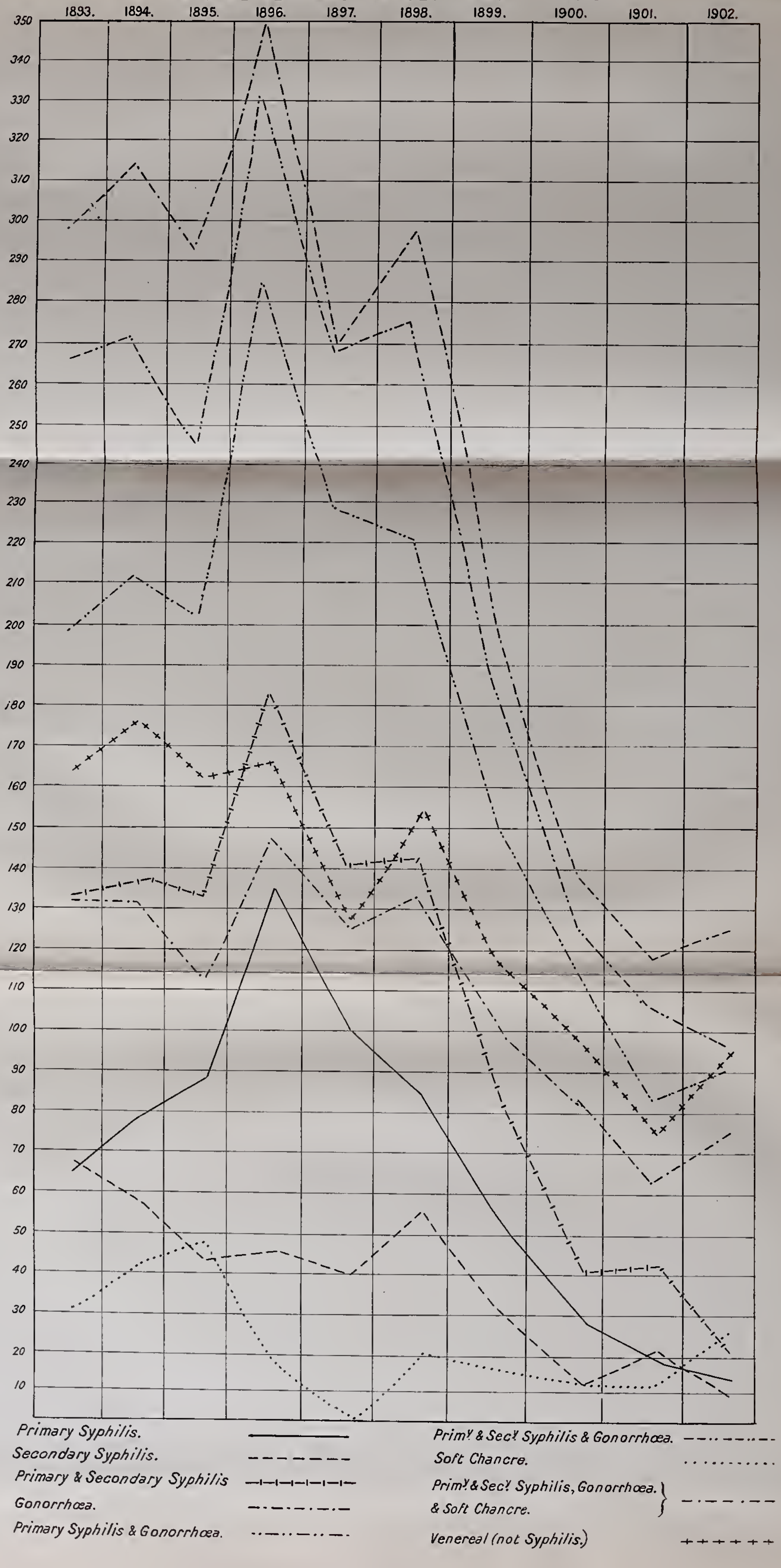

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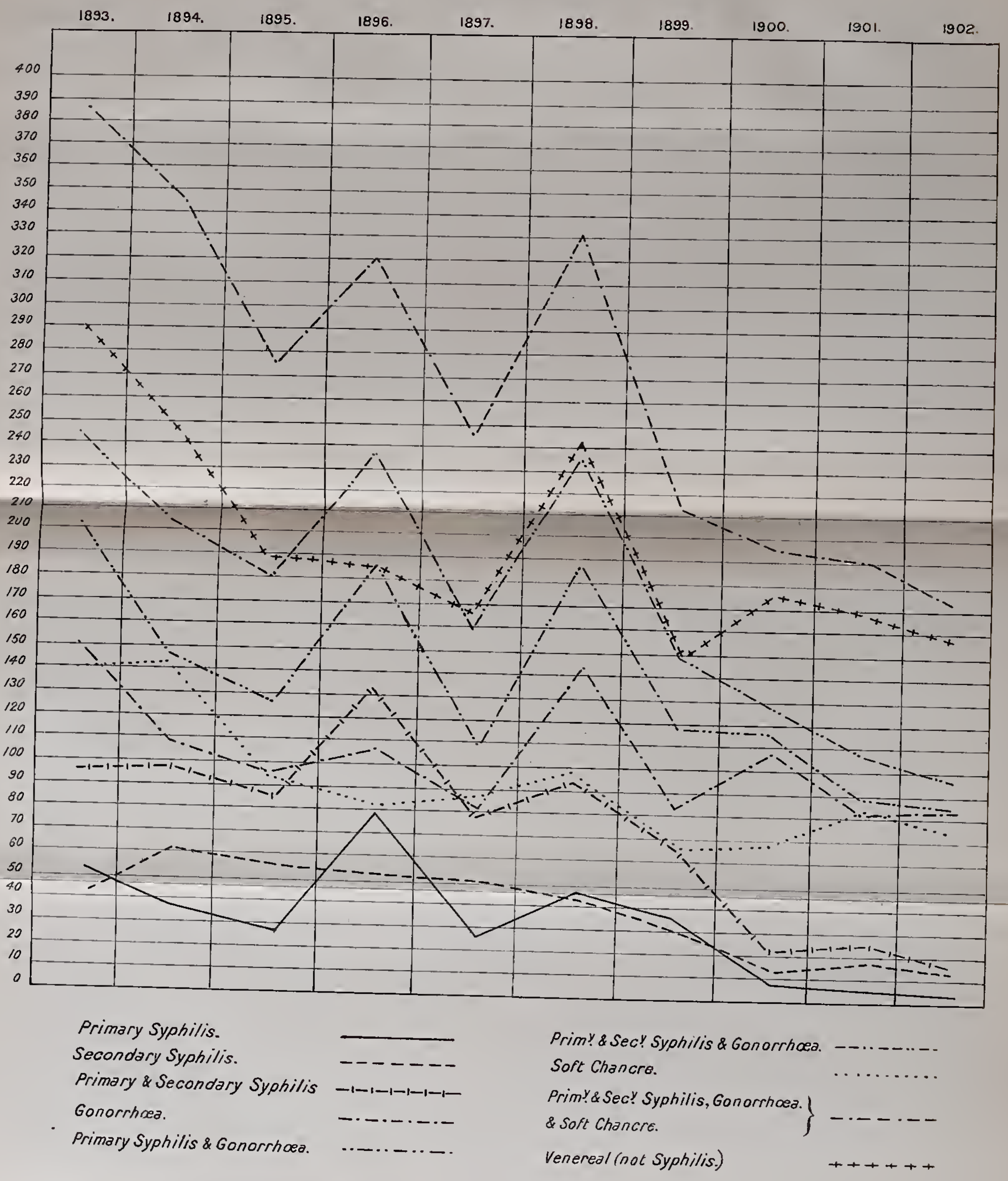
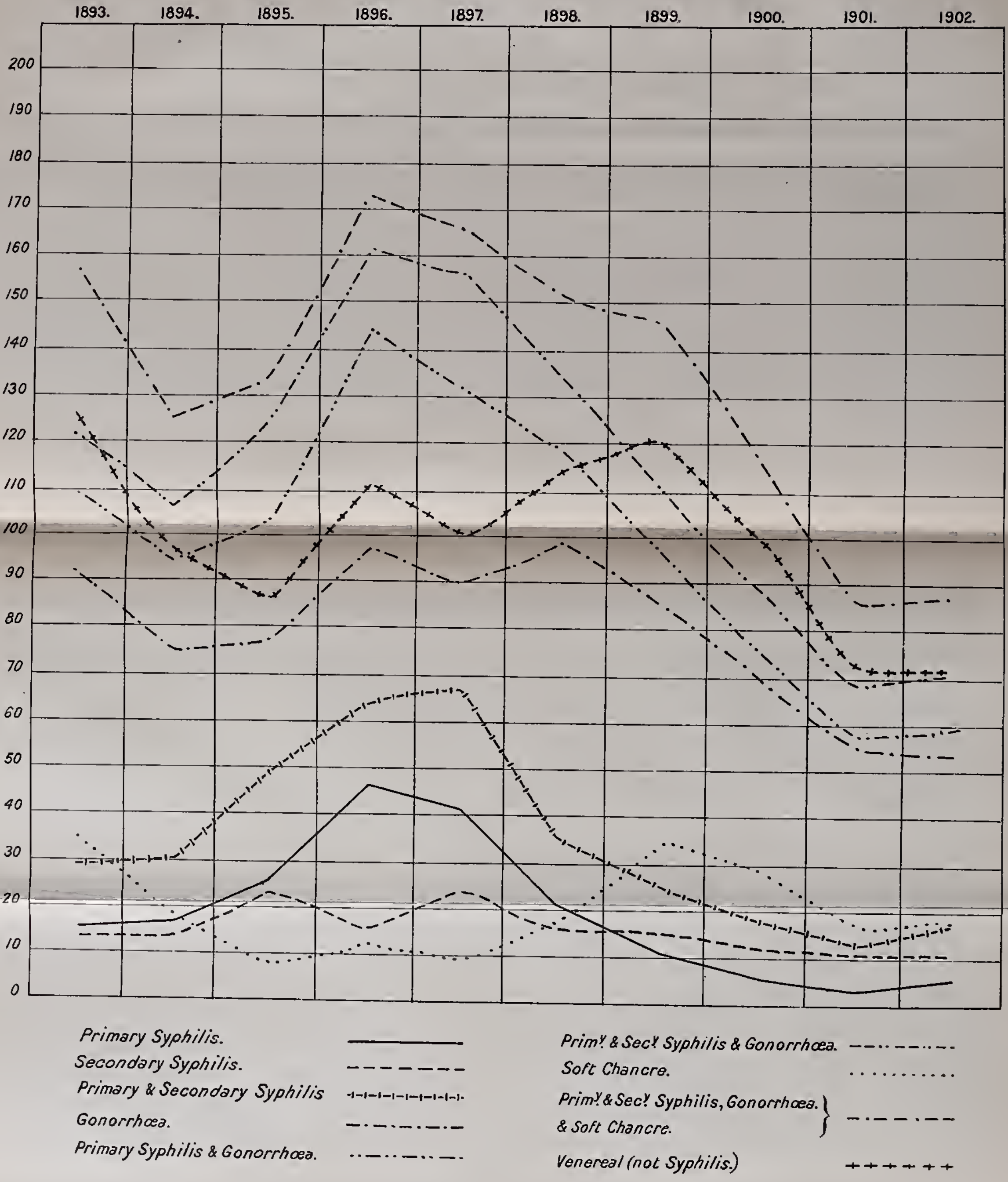


Plate XXXIV.

MALTA.

GENERAL VENEREAL TABLE _ ADMISSION RATIO



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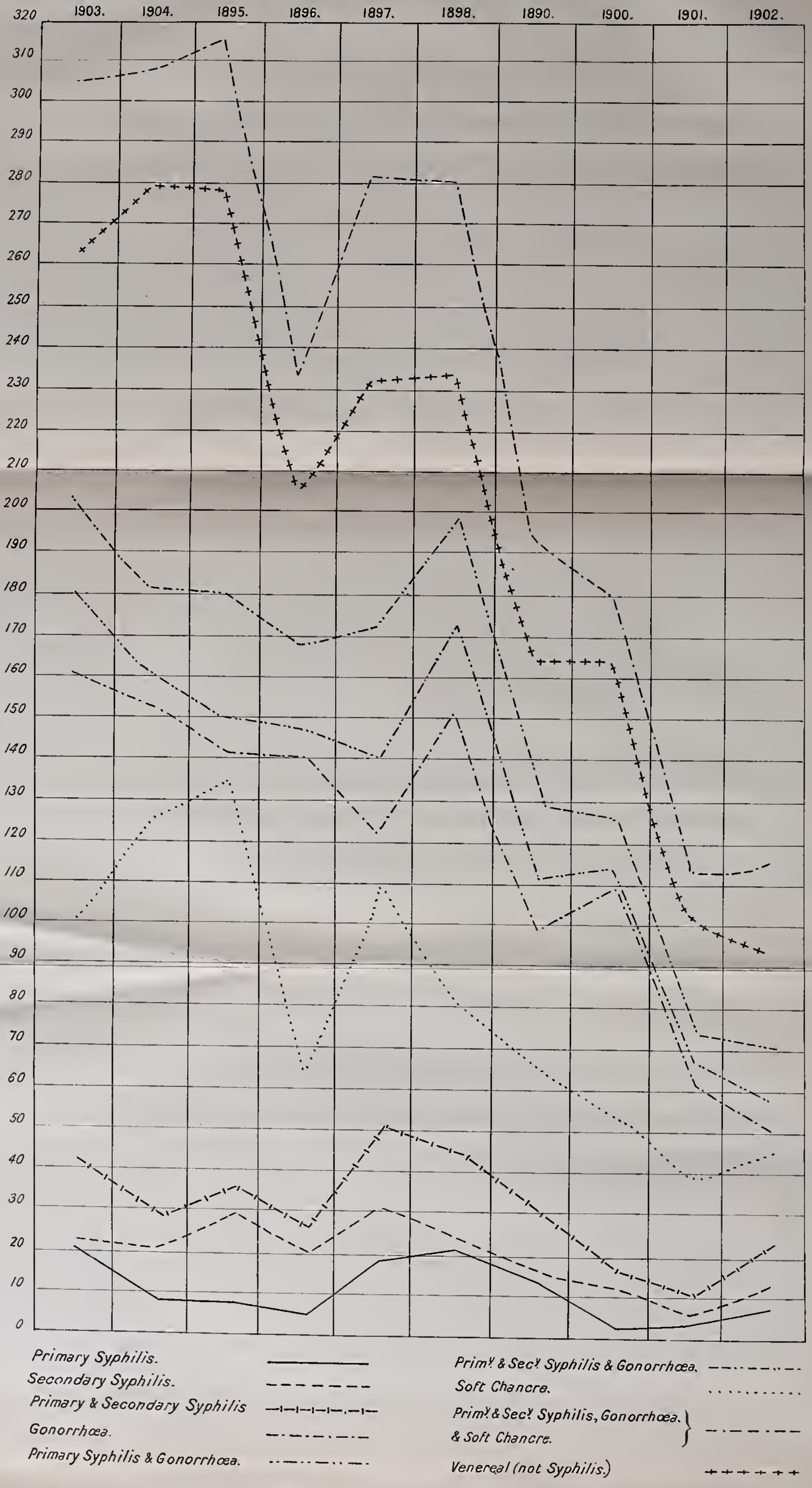

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